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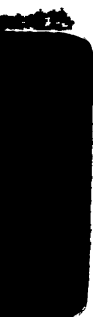
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# AUTOMOBILE JOURNAL

\$1.00 the year  
10 cents the Copy

PAWTUCKET R.I.

August 10, 1913

642466

(1913/1)

## Why several grades?

We make several different grades of Gargoyle Mobiloils.

The grades all differ in thickness, or "body".

These oils meet the most severe physical tests that have ever been exacted from automobile lubricating oils. In sheer lubricating *quality* they stand alone.

But that, of itself, is not sufficient.

To properly reach the many friction points the oil's "body" must be suited to your feed system.



To make this condition plainer, a homely illustration may be taken from the sewing room:

A fine thread is often too

light for the wear required. A heavy thread is often too thick to pass through the eye of the needle.

Neither meets requirements.

So it is with automobile lubricating oil.

Quality equal, the heaviest-bodied oil will prove the most durable. But to be of service it must be able to properly pass through your lubricating system.

The conditions to be met are complex. The problem is serious. Motors differ. Feed systems differ.

Before the oil which best combines durability with ability to meet the feed requirements of your car can be determined, the construction of your motor must be known and carefully considered.

To meet these conditions, we analyze each year the motor-construction of each of the season's models.

Guided by this analysis and

by practical experience we determine the correct grade of Gargoyle Mobiloil for each make of car.

Our findings we list in a lubricating chart, which will be mailed you on request.

The superior efficiency of these oils has been thoroughly proven by practical tests.

*If you use oil of lower lubricating quality or of less-correct "body" than that specified for your car, loss of power, unnecessary friction, and ultimate serious damage must result.*

A booklet, containing our complete lubricating chart, together with points on lubrication, will be mailed you on request.



## Mobiloil

A grade for each type of motor.

The various grades refined and filtered to remove free carbon, are: Gargoyle Mobiloil "A," Gargoyle Mobiloil "B," Gargoyle Mobiloil "D," Gargoyle Mobiloil "E," Gargoyle Mobiloil "Aretic."

They are put up in 1 and 5 gallon sealed cans, in half-barrels, and barrels. They are sold throughout the world. All are branded with the Gargoyle, which is our mark of manufacture. They can be secured from all reliable garages, automobile supply stores and others who supply lubricants.

VACUUM OIL COMPANY, Rochester, U. S. A.

#### BRANCHES:

DETROIT  
Ford Bldg.

BOSTON  
49 Federal St.

NEW YORK  
29 Broadway

CHICAGO  
Fisher Bldg.

PHILADELPHIA  
4th & Chestnut Sts.

INDIANAPOLIS  
Indiana Pythian Bldg.

MINNEAPOLIS  
Plymouth Building

Distributing warehouses in the principal cities of the world.



## Removal Notice

To meet the tremendous increase which there has been in the demand for MULTIBESTOS BRAKE LINING, STANDARD WOVEN BELTING and SOLID MULTIPLE HOSE FABRICS a new factory has been built and equipped for the manufacture of these products on a much larger scale.

This has made necessary the abandonment of our old plant at Worcester where we have done business for many years, but where facilities were proving more and more inadequate to meet the growth and expansion of our business.

In the new factory at Framingham will be found every modern feature tending to promote quality and economy of production, not only of our present lines but of extensions which embrace everything in the way of woven fabrics for mechanical purposes.

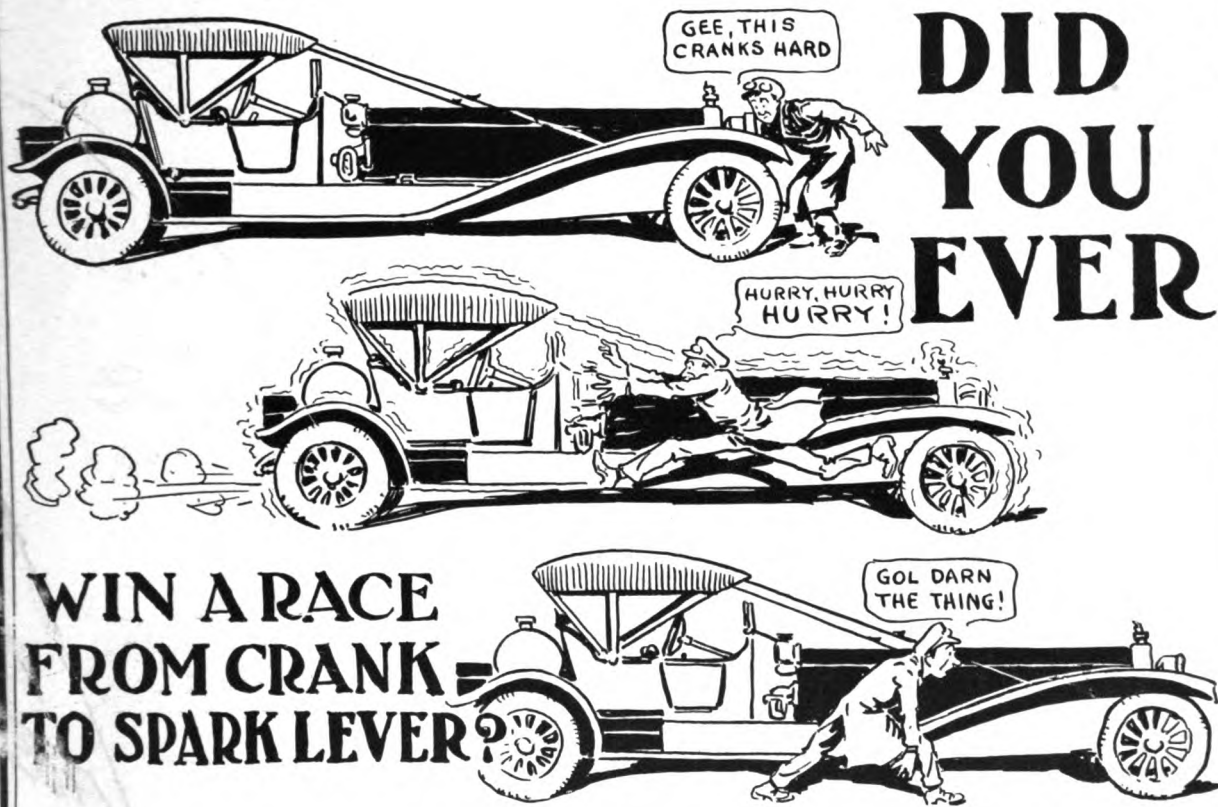
Under such ideal conditions for doing business we can ask a continuance of orders from old customers and an investigation from new prospects with the full confidence that we can serve them to their profit and entire satisfaction.

**Standard Woven Fabric Company**

Framingham, Massachusetts

August First  
Nineteen Thirteen





SURE YOU HAVE, and many is the time you've lost out, too, and had to run it over again.

But when you buy your new car equipped with Electric Cranker and crank it by the push of a button without leaving your seat, you'll sing pæns of praise for the



## STORAGE BATTERY

which makes Self Cranking the satisfying, gratifying success of the present day.

*Write us for full information*

## Willard Storage Battery Co.

New York Branch: 136 W. 52d St.  
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CLEVELAND, OHIO

Chicago Branch: 2241 Michigan Ave.  
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Depots in all Principal Cities in the United States, Canada and Mexico

(57)

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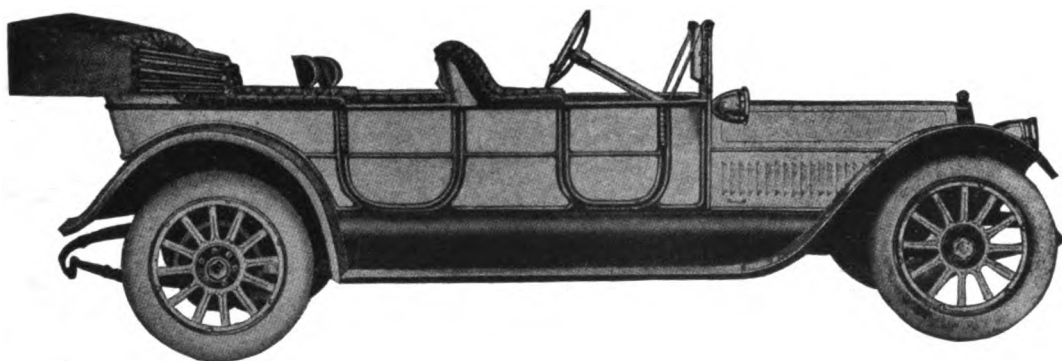
## Our Exclusive Feature

We will (at small extra cost) furnish  
our Regular Models with the



# AUSTIN Two-Speed Axle

This axle provides two different gear ratios, both on direct drive, and in combination with a three-speed transmission gives six speeds forward and two reverse.



Model "77" has a Regular Direct Drive of 3 1-2 to 1, and a Special Direct Drive of 2 to 1.  
Model "55" has a Regular Direct Drive of 4 1-2 to 1, and a Special Direct Drive of 3 to 1.

The Regular Direct Drive provides ample power and exceptional ease of control for hills, bad roads and crowded city traffic.

The Special Direct Drive for normal conditions, shows a gain of over 50% in mileage for the same fuel consumption and motor speed, eliminates the noise, wear and tear of running the motor at excessive speeds, adds materially to the life and durability of the car and pleasure of riding.

|   |   |   |           |
|---|---|---|-----------|
| Model "77" Six Cylinders, 4 1-2 x 7     | - | - | \$6000.00 |
| Model "66" Six Cylinders, 4 1-2 x 5 1-2 | - | - | \$5000.00 |
| Model "55" Six Cylinders, 4 x 5         | - | - | \$4000.00 |

**MORE NEW, IMPROVED and DISTINCTIVE FEATURES** than any other car.  
Two-speed rear axle, high pressure air self-starting system, complete electric lighting system, left hand steer, center control, two-spark magneto, four-speed transmission, both brakes controlled by foot pedals.

*Write for complete description and any information you may desire in regard to our two-speed axle.*

## Austin Automobile Company

GRAND RAPIDS, MICHIGAN





Polarine

Acknowledged the Standard Oil  
**For all Motors**



Use Standard Oil Company's Gasoline  
**STANDARD OIL COMPANY**  
OF NEW YORK

When Writing to Advertisers, Please Mention The Automobile Journal.



# The 8-DAY } "BOSTON" AUTO HIGH GRADE } CLOCKS

These superbly built 8-day, high-grade clocks have seven-jeweled escapements, Breguet hairsprings, cut steel pinions, compensation balances, dust and water proof cases, etc., and are dealt in and used by those demanding a first-class article.

**QUALITY and PRICE — UNAPPROACHABLE**

**Ask Your Dealer for the "BOSTON" AUTO CLOCK**

**MODEL B**

**MODEL C**



Adjustable to various angles by Ratchet and Nut at back. In general appearance it closely matches many makes of speedometers.

**MODEL D**

**MODEL E**



## PRICE LIST— PER CLOCK

| SIZE (Dial)          | MODELS A, B, C. | MODEL D | MODEL E |
|----------------------|-----------------|---------|---------|
| 3-inch . . . . .     | \$18.00         | \$21.00 | \$24.00 |
| 3 1-2-inch . . . . . | 20.00           | 24.00   | 27.00   |
| 4-inch . . . . .     | 22.00           | 27.00   | 30.00   |

For (Patent Applied for) Outside Stem Winding and Stem Setting Device, ADD \$3.00 to above prices.

Superior to other devices. A great convenience for winding clock and setting the hands without opening the clock case.

☞ All sizes stated are the approximate diameters of the dials

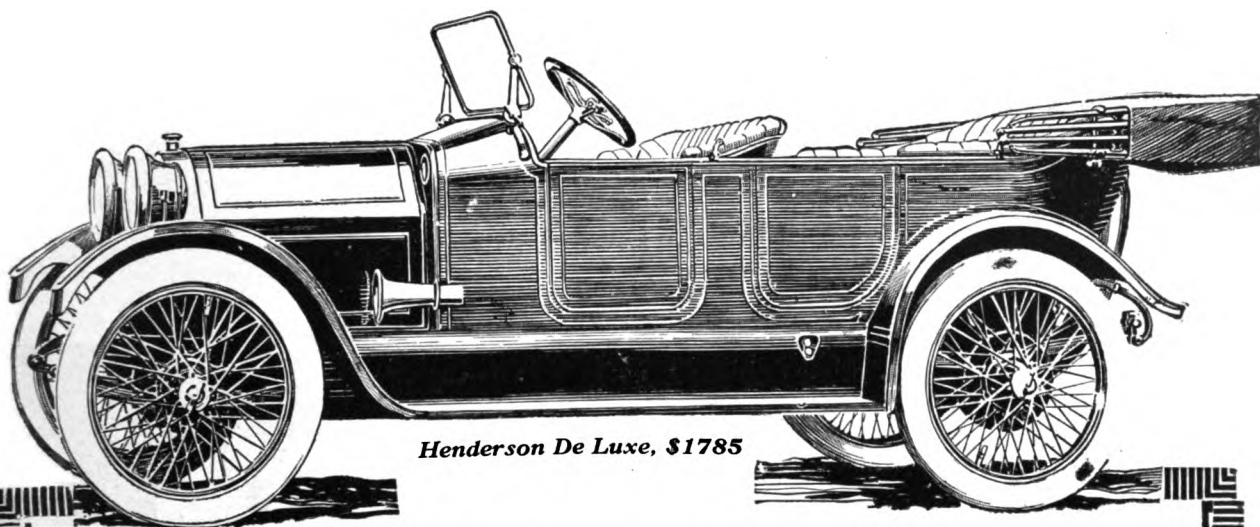
The 8-Day } "BOSTON" AUTO } For AUTOMOBILES  
High Grade } CLOCK } and MOTOR BOATS

On Sale By Leading Jobbers and Dealers.  
If Not With Your Dealer Sent on Receipt of Price.

**BOSTON CLOCK CO., 16 State St., Boston, Mass.**

When Writing Advertisers, Please Mention The Automobile Journal.





Henderson De Luxe, \$1785

## —the Money in Selling Next Year's Cars

By C. P. Henderson

The chances are—if you sell moderate-priced cars—you've seen *next year's* models at the factories.

You know then that wire wheels, kerosene-burning cars, left drive, the new center seat control, cowl dash, cowl gasoline tanks, dust-proof en bloc motors, over-size cooling and, of course, electric self-cranking systems, electric lights are what *will sell* the leaders among 1914 automobiles.

But you are still selling 1913 models—and your prospects are holding off for 1914. *You can't take a profit on them now.*

But your overhead expense goes on, your most precious asset—time—slips by; some people buy other cars at discount—money is being eaten up—*yet the business pays no profit! At the heaviest buying season of the year.*

### You Should Sell 1914 Cars Today

You ought to be offering prospects 1914 cars today!

That is the secret of making money—sell *next year's* cars that people are *waiting* for—therein lies the *money*.



This is what Henderson dealers the country over are doing today. We've been shipping since May 20.

They offer a kerosene-burning car that solves the vital fuel problem; wire wheels are optional. The logical left drive combined with the convenient *new* center seat control; cowl gasoline tank, cowl dash, oversize cooling of the dust-proof en bloc motor; oversize tires and, of course, electric self-cranking and electric lighting systems are the 1914

features you *could* offer today to your prospects who are *holding off*.

You *could* get this quick profit if you were a Henderson dealer, for they are getting it.

And, if you are the type of man we like, we would welcome a wire from you about territory—or you might write or come to the factory.

May we hear from you quickly?

## HENDERSON MOTOR CAR CO., Indianapolis, Ind.

# HENDERSON





# COES

## THE Wrench Supreme

Strength without bulk or clumsiness.

Ease of handling without slipping or bruising.

Perfect balance and right grip

Everything the motorist desires in a wrench is to be found in the "COES" Trade Mark Reg. U.S. Pat. Office AUTOMOBILE MODEL, and you will never know perfect wrench service until you pin your faith to it.

It stands to reason that the 5 per cent. more you pay for a "COES" Trade Mark Reg. U.S. Pat. Office wrench goes for 60 per cent. more quality and service—put this wrench in the tool kit and shop. You will get your money's worth.

Send for Literature Now.

### Coes Wrench Co.

WORCESTER, MASS.

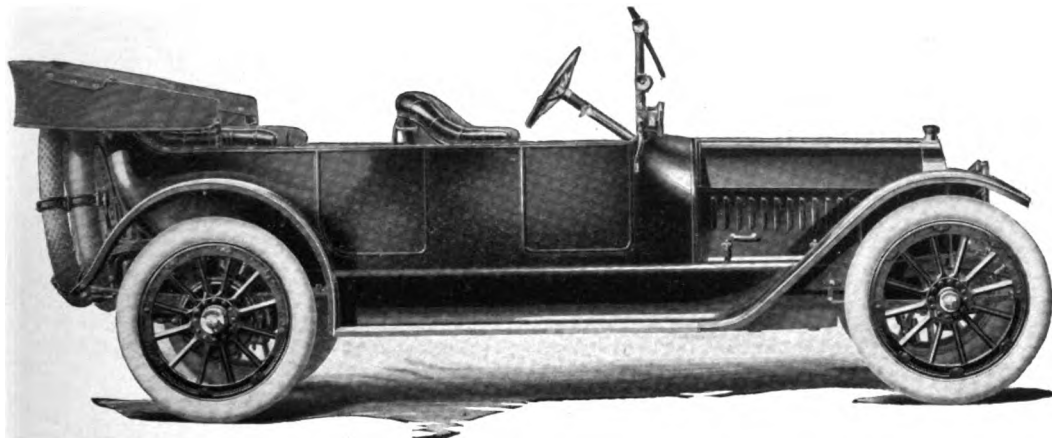
J. C. McCARTY & CO.,  
21 Murray St., New York City

JOHN H. GRAHAM & CO.,  
113 Chambers St., New York City

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# Another History-Making "Six"



**This new KisselKar 48 "Six" repeats the triumph of the big KisselKar 60 "Six"**

Popular response has been decisively favorable to the recently announced new model 48 "Six" which bids fair to equal the sensational introduction of the KisselKar 60 "Six," the car that pioneered the downward trend in big "Six" prices a few years ago. The *principal* reasons for the instantaneous success of the new KisselKar 48 "Six" are threefold: *appearance, mechanical perfection and riding comfort*. These three factors quickly determine the status of a new model and challenge an immediate verdict. You look at a car to feel its "personality"; you examine it to measure its mechanical perfection; you *ride* in it to *know* its *comfort*. These are the tests that quickly tell the story of the KisselKar success.

## 48 "SIX" KISSELKAR 60 "SIX"

Only a few of the very highest priced cars equal the KisselKar 48 "Six" in appearance and elegance of equipment. And it is a car of supreme comfort.

The extra liberal 132-inch wheelbase bridges the inequalities of the road, giving a special steadiness of motion. Sidesway on all but the roughest roads has been eliminated, hence no necessity for occupants to "brace" themselves in a tense, tiring position.

Big wheels and big tires absorb road vibration and reduce it to the minimum. The riding comfort of the KisselKar 48 "Six" is the result of perfectly balanced construction, every part in exact and harmonious relation to every other part.

A silent, powerful and responsive long-stroke motor, with plenty of excess power, takes you to your destination as slow as a walk or as fast as you care to go—uphill or down—without the necessity of shifting gears. The KisselKar 48 "Six" is electric lighted and started. It has left-hand drive and center control.

No other car at the price—\$2350, fully equipped—approaches the KisselKar 48 "Six" in design, power, equipment, beauty of lines and riding comfort. The KisselKar 60 "Six" at \$3150 is the dominant big car value in America. The KisselKar 40 "Four" at \$1850 is the leader of its class and type.

KisselKar models are now being shown at all our branches. Look up the dealer in your locality, or write for illustrated catalog.

### KisselKar Service Contract

The KisselKar is sold under a written guarantee of service to owners—a tangible, definite and specific contract that clearly stipulates the scope of KisselKar Service and provides for care that forestalls trouble and retards depreciation.

**KISSELKAR TRUCKS, 1500 LBS. TO SIX TONS—WRITE FOR CATALOG**  
**KISSEL MOTOR CAR CO., 174 Kissel Avenue, Hartford, Wis.**

BOSTON NEW YORK CHICAGO MILWAUKEE KANSAS CITY MINNEAPOLIS ST. PAUL  
 DALLAS SAN FRANCISCO LOS ANGELES OAKLAND  
 Philadelphia Detroit Houston El Paso Washington Baltimore Nashville Duluth Buffalo Pittsburgh  
 Hartford, Conn. New Haven Albany Troy Rochester Providence Cincinnati Newark Montreal Quebec  
 Toronto Winnipeg Calgary and 300 other principal points throughout America.

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## Honest Now, Mr. Automobile Dealer Are You Making Enough Money?

Here's what a lot of dealers are up against. Maybe you're in this class. They are doing a good business—selling quite a bunch of cars and making a good profit, *if* they could *hang on to it*. But here's where the trouble comes in. Every time something goes wrong, (fancied or real) with the car of the customer, ting-a-ling goes the phone, or in comes Mr. Customer to have his car fixed up, and, of course, there can be no charge, because he bought it from Mr. Dealer and *he* is responsible.

Now there's just one way to dodge all this kind of trouble—get a car that doesn't need much of this kind of attention. Through all these 20 years of auto building, our one goal has been—make the Haynes perfect—make it so trustworthy and simple that it will stay in running order and give satisfaction through hard use and even abuse in the hands of unskilled drivers.

Connect up with the

# HAYNES

—the Car *without* the "Come-Backs"

We'll be glad to tell you how simple the Haynes is in every part—glad to tell you how carefully each car is manufactured in our own shops or under our direct supervision—glad to tell you the tests which every separate part, and the car complete are required to meet. We'll also be glad to tell you what Haynes dealers say as to the satisfaction given by the Haynes and how little bother they have with "come-backs."

### Specifications of the New Haynes

**Motor**—Bore 4 1-4 in., Stroke 5 1-2 in. L-head Haynes. Cylinders cast in pairs.

**Cooling**—Centrifugal pump and pressed steel fan.

**Wheel Base**—Model 26, 130. Model 27, 136. Model 28, 118.

**Ignition**—American Simms Magneto.

**Lubrication**—Splash and gravity feed.

**Control**—Left hand. Vulcan Electric Gear Shift.

**Transmission**—Selected Type, three speeds forward, one reverse.

**Steering Column**—Worm and worm gear type.

**Clutch**—Haynes contracting steel band.

**Rear Axle**—Full Floating Timken on Models 26 and 27; McCue, Model 28, Gourney Bearings.

**Front Axle**—I-Beam. O. H. steel heat treated

**Wheels**—Artillery type. Funk demountable rims.

**Tires**—Models 26 and 27, 36x4 1-2. Model 28, 34x4.

**Springs**—Front Semi-elliptic 39 1-8x2, rear 48x2.

**Brakes**—15 1-4 external and 15 internal on Models 26 and 27. 12 and 16 internal on Model 28.

**Finish**—Indian dark blue body.

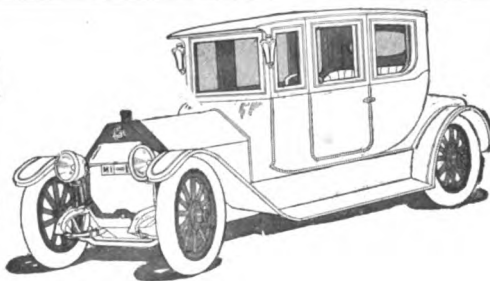
**Gasoline Feed**—Pressure. Automatic feed.

**Upholstery**—Buffed leather—deep cushions.

**Starting and Lighting**—Leece-Neville electrical system.

**Dash Equipment**—Electric lights, sight oil feed, automatic cut-out for generator, dash light, auxiliary air pressure pump, air gauge and speedometer. Models 26 and 27 have rim wind clock.

**Other Standard Equipment**—Top, top cover of silk mohair, mechanical tire pump, rain vision ventilating wind-shield, Vulcan electric gear shift, two large electric head-lights, electric side lights, electric tail light, full dash equipment, electric starter, generator, 80 ampere hour storage battery, speedometer, horn, coat and foot rails, tire irons, full tool equipment, and one extra demountable rim.



When Writing to Advertisers, Please Mention The Automobile Journal.



## The New Haynes Models Have the Season's Biggest Feature—the Vulcan Electric Gear Shift

Here's another thing a lot of dealers are up against—and maybe this also applies to you. They're handling a good car, gives good satisfaction, customers pretty well pleased, but the drawback is—there is nothing different, nothing distinctive about the car to make people go out of their way to come in and see it.

The new Haynes has a selling wallop that bring the prospects in and helps you put over the sales. In addition to everything that can be desired in the way of comfort, convenience, equipment and prestige of twenty years building—it has the wonderful Vulcan Electric Gear Shift.

Connect up with the

# HAYNES

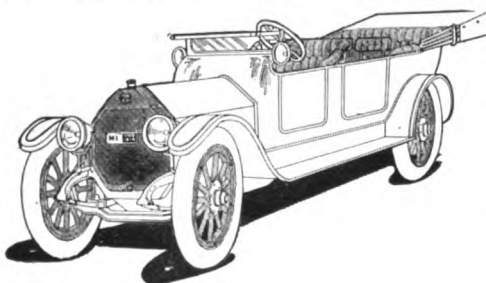
—the Car that Is Always *First*

True to its reputation as pioneer and pacemaker, the Haynes was first to adopt this the greatest improvement in automobile equipment. Added to the electric self-starter and electric lighting, is everything else in the way of modern equipment—it makes the Haynes the strongest kind of a selling proposition. Read the specifications and see for yourself.

### Get After the Haynes Agency Today

If you are in business for money, not merely for your health—if you would like to get hold of the agency for a car that's a live seller, that's famous for its quality and dependability—that stays sold and stops the "profit-killing come-backs"—if you would like to do business with a *stand-by* and a *fixture* in the auto business, insure your business for the future—and if you would like to make the coming year *your biggest year*, write us today about the Haynes, America's First Car and the car with the wonderful Vulcan Electric Gear Shift.

**The Haynes Automobile Co., 6 Main St., Kokomo, Ind.**



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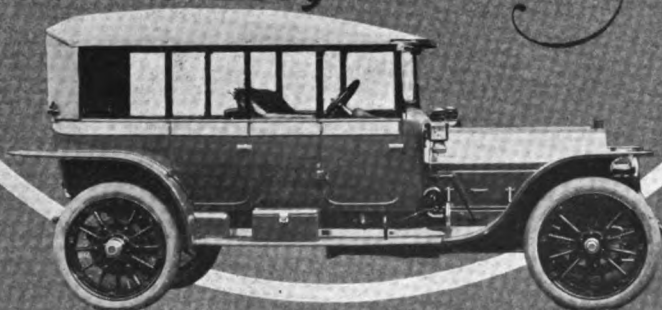


# SPRINGFIELD METAL BODY CO



Springfield Convertible Bodies  
A Construction Giving the  
Qualities of a Limousine & Tour-  
ing Equipment That May Be Con-  
verted as Quickly as a Folding Top  
Can be Raised or Lowered. When  
folded the Full Space of the Touring  
Car is Available — When Raised It  
is a Regular Top or It Can Be Glass  
Enclosed.

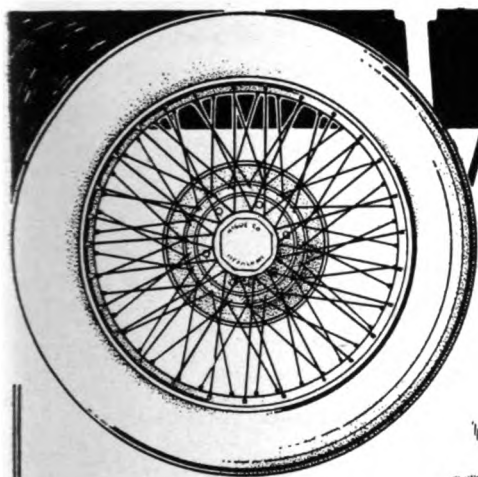
Dealers, Who Insist on Quality  
Equipment, Specify The Springfield  
Convertible Body.



# SPRINGFIELD, MASSACHUSETTS

M





## McCUE WIRE WHEELS

**O**NLY one tire burst in 570 mile race. Boillot, winning the French Grand Prix on a wire wheel Peugeot, blew out but one tire in the entire 570 miles. Towards the end of the race while making a stop for fuel he changed one other as a matter of precaution. The Excelsior cars, two of them, ran the entire 570 miles without making one single tire change. Commenting on the tire situation in this race "The Automobile" says: "There was very little tire trouble in the race. . . . Altogether the tire situation was very satisfactory, for this was the longest road race in the world—570 miles—and all European speed records were broken."

*Can you ask for more certain proof of the tire economy feature of wire wheels?*

Not a single wooden wheel equipped car competed in this French classic—certain proof of the confidence the world's greatest drivers have in the tire saving ability of wire wheels.

Insist upon wire wheels on your car for the reason that wire wheels

Increase tire mileage about 50 per cent.  
Safeguard your life in case of accident.  
Increase your car life.

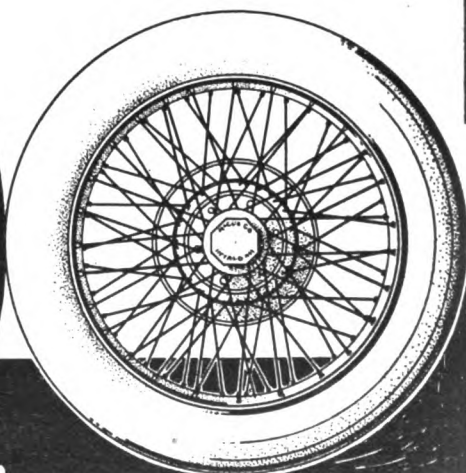
Make an easier riding car.  
Make an easier steering car.  
Make a better looking car.

Increase your mileage per gallon of fuel.

McCue Wire Wheels are equipped with (S) spokes, made by the Standard Company, of Torrington, Conn.



**McCUE CO.**  
**BUFFALO-N.Y.**



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# INVADER OIL

**THERE ARE ANY NUMBER OF OIL SALESMEN** but it is not always easy to believe what they tell you.

**THERE ARE ANY NUMBER OF OIL COMPANIES** who fill the pages of the magazines with advertisements of their various oils, but it is not always easy to believe what they tell you either.

**ONE OIL COMPANY** prints a list of automobile manufacturers who, it is to be inferred from the language employed, are "vigorously insisting" upon owners of their cars using this particular oil—while as a matter of fact *over 70 per cent. of these manufacturers have stated in reply to written inquiries that they either use or recommend an entirely different make of oil.*

**ANOTHER OIL COMPANY** states that their oil is superior to other oils because it will not "freeze"—while as a matter of fact a motor oil is required to stand heat, not cold. A capacity to withstand cold indicates that the oil has an asphalt base, which is probably the worst thing that can be said about a motor oil.

**ANOTHER OIL COMPANY** states that their oil is "accurately compounded and scientifically prepared"—which means exactly nothing.

**ANOTHER OIL COMPANY** states that their oil contains "no carbon" which is a physical impossibility since carbon is one of the elements of which all mineral oils are composed. (All oils must contain some carbon.)

**AND THE VERY OIL COMPANY** who claims to know the most and who ask you to use the oil they make because they are the world's foremost experts on lubrication *once had some brass tags printed and attached them to the motors of a certain make of automobile, advising the use of a black steam cylinder oil.* They might as well have recommended a good grade of glue.

**THE WHOLE TRUTH OF THE MATTER** is that a majority of both those who make oil and those who sell it either know absolutely nothing whatever about it *or else are not willing to be honest about it*, and what they say and what they print proves it.

**When Writing to Advertisers, Please Mention The Automobile Journal.**



These are the facts. An automobile oil is required to do two things—(1) lubricate and (2) burn up cleanly—and the ability of any oil to perform these operations can be absolutely determined by the employment of a few simple physical tests.

Take the gravity test as an illustration. Everyone knows that carbon in a motor oil is objectionable, and it is a well known fact that the amount of carbon in an oil is proportionate to its weight or gravity. The lighter the gravity the less carbon the oil contains, and other things being equal the better the oil will be.

To ascertain which of two oils has the lightest gravity and the least carbon is easily done. Simply take two samples of oil in glass bottles, (Invader Oil and any other) and pour a few drops of the other oil into the Invader Oil. If the other oil sinks to the bottom of the Invader Oil it is because the other oil has a heavier gravity—it will contain more carbon—it will not be so good an oil for automobile lubrication.

To say that an oil with low tests is superior to an oil with high tests is absurd. It is equivalent to saying that 5 pounds of iron weighs more than 7 pounds of iron.

An unsupported statement therefore to the effect that one brand of oil is better than another means absolutely nothing. *The fact that Invader Oils have better tests than other oils, however, means everything.*

The only question which the buyer of Invader Oil has to consider is whether or not Invader Oil is worth its difference in price. *The fact that it is better cannot be contradicted.*

---

**I-O-C GEAR OIL** is the only oil ever made especially and exclusively for the lubrication of Automobile Transmission gears. Write for prices and descriptive booklet.

---

# INVADER OIL COMPANY

(LESSEES OF CHAS. F. KELLUM & CO.)

Main Office—76 Broad Street

Factories—New York and Philadelphia.

Boston  
284 Columbus Ave.

Philadelphia  
113 Arch St. and 719 Broad St.

Washington  
3627 New Hampshire Ave., N. W.

## TERRITORIAL AGENTS:

Boyer-Campbell Company  
Motor Car Supply Co.  
Bock & Corbitt Iron Co.

Detroit, Mich.  
Chicago, Ill.  
St. Louis, Mo.

The Lee Hardware Co.  
American Lubricating and Supply Co.  
James Bailey Company

Salina, Kans.  
Kansas City, Mo.  
Portland, Me.

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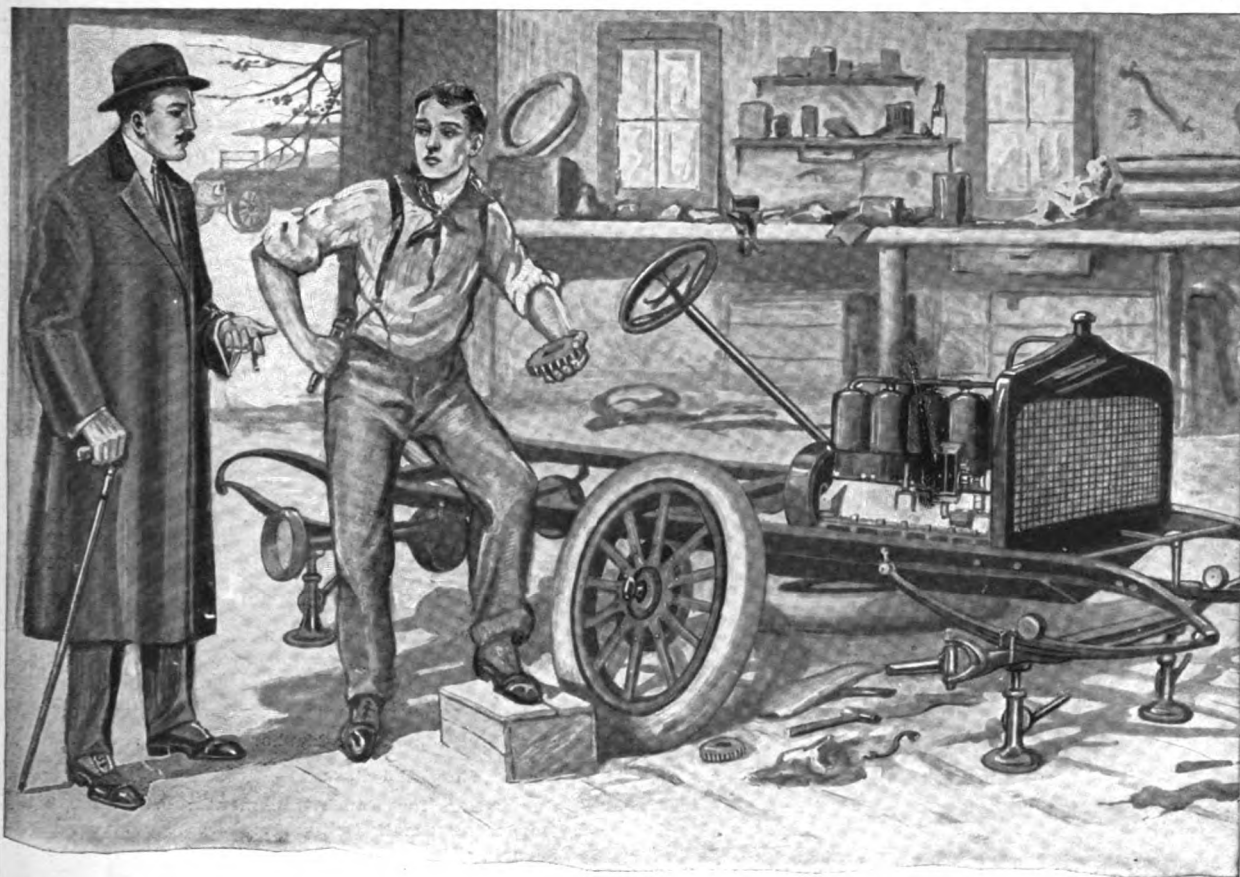
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\*Indicates article is illustrated.





# 1914

## *Maxwell Announcement*

### This Ad Is To Dealers Direct

**D**OUBTLESS you have read our 1914 announcement which appeared in all the big daily newspapers east of the Rockies last Sunday, and will appear in all the large newspapers west of there next Sunday.

Just in passing, might mention that this is only the first of a series of big advertising campaigns. This one cost approximately \$30,000, and is just an indication of how we are going to sell the product for our dealers.

That is one of the reasons why 4,000 dealers are going to handle this line—and they will be 4,000 of the best dealers in the United States. The other reason is that the dealer who investigates will find that here is a line he cannot duplicate anywhere else.

You have had experience doubtless with handling lines of cars with various models by the same maker in different priced classes. You know what ordinarily happens. One or two of the models are ready sellers—but there is always one that drags. Always one that the sales manager tells you you must take if you are to get the others.

That is what we have in mind when we

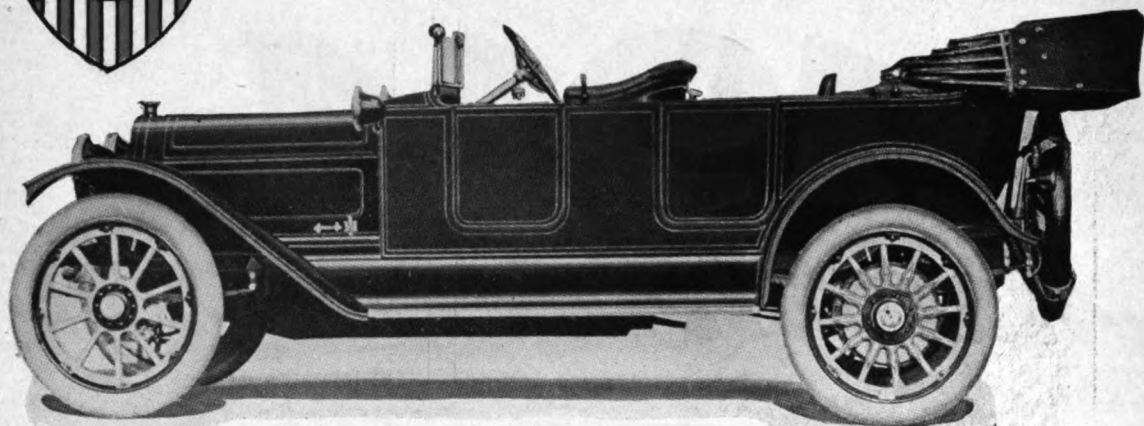
say that the Maxwell line for 1914 cannot be equaled anywhere else.

Take, for example, the highest priced car in the line—Maxwell "50-6." Ordinarily you would expect the big fellow to be the one that would drag if any did.

We refer you to last season's experience—the season which closed August 1st—and call your attention to the fact that we were the only makers of sixes in this class who had not a car left in his factory on that date.

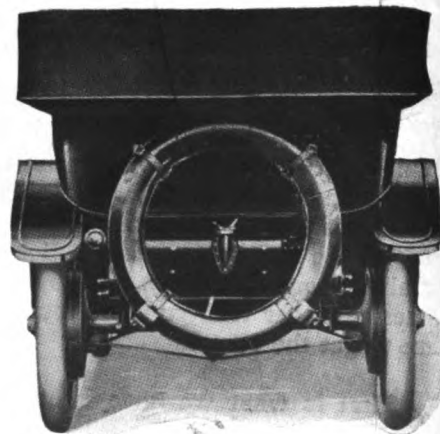
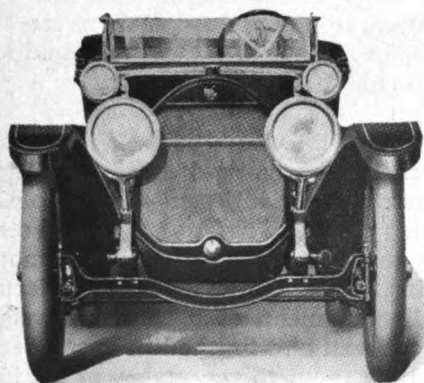
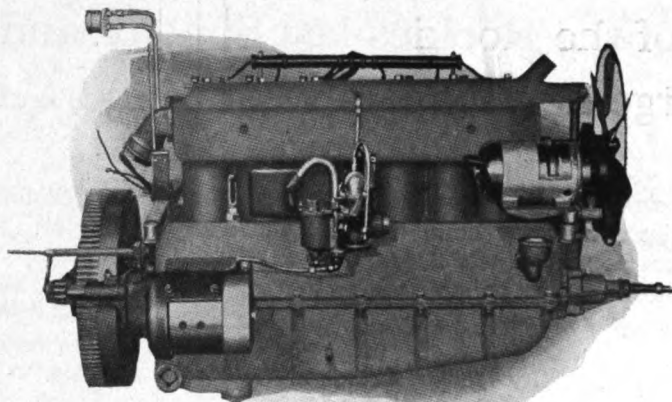
Price last season was \$2350. Without the slightest change—because we did not know how or where to make it better—except to give the buyer his choice of right or left hand steer—we have made the price of the 1914 model \$1975. This, with Gray & Davis Electric starter, full equipment, even to electric cigar lighter in tonneau and finished in every detail so that it puts it up to the maker of a \$4000



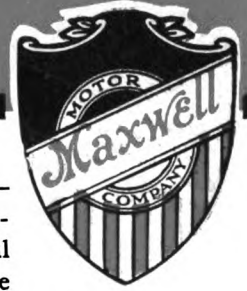


### 1914 Maxwell "50-6"—\$1975

The sweetest running thing on wheels. Six-cylinder motor, bloc-cast, 50 h. p. 130" wheel base; electric starter and lights; Bruce Ott body; 5-7 passengers; disappearing seats; 36"x4½" tires all 'round. Luxuriously finished, long, easy riding springs and full equipment, including ventilating windshield, top and Jiffy curtains—even an electric cigar lighter. Left or right side drive optional.







car to prove where he gives the difference in quality.

The six is a flexible proposition from a manufacturing standpoint. That is to say, we can increase or retard the production of a car of this type, so as to make 2000 or 3000 or 4000 or 5000 or 6000 of them, according as the demand develops.

With the model "25," for example, this would be impossible. It is a quantity production proposition, and if we are going to make 30,000 of them—as is our plan—we must equip for that many and we must make that many in order to make them at the price. You can understand this even if you are not a manufacturer.

As I have said, the six is a flexible proposition. We enjoyed a splendid demand for the 1913 model, at \$2350. We intended to make the price \$2400 for 1914—in fact, we said as much in our ads recently. But you have doubtless noticed there is a red-hot contest on for supremacy in this class of car—it is a rather easy class for smaller manufacturers and assemblers to get into. You have noticed some cut-throat methods of late. It did not touch us because we were sold out.

But looking the situation over, Mr. Flanders said: "We can doubtless sell all the sixes we make at \$2400. But I do not propose that our sales force shall be engaged in forcing any one model. Every car in the line must sell on its own merits and meet its own competition entirely independent of any other car in the line."

"Now, inasmuch as some folks have started something, I am going to give them a car that is known as the sweetest six on wheels, and at a price they cannot surpass and stay in business. We will just make it \$1975, and we will make it just as good as we can—and see how far the others can follow the pace."

So you see the big car—the big seven-passenger fellow—which will naturally command a lesser demand, and which you would expect to be the tardy one, will probably prove to be the leader of the line.

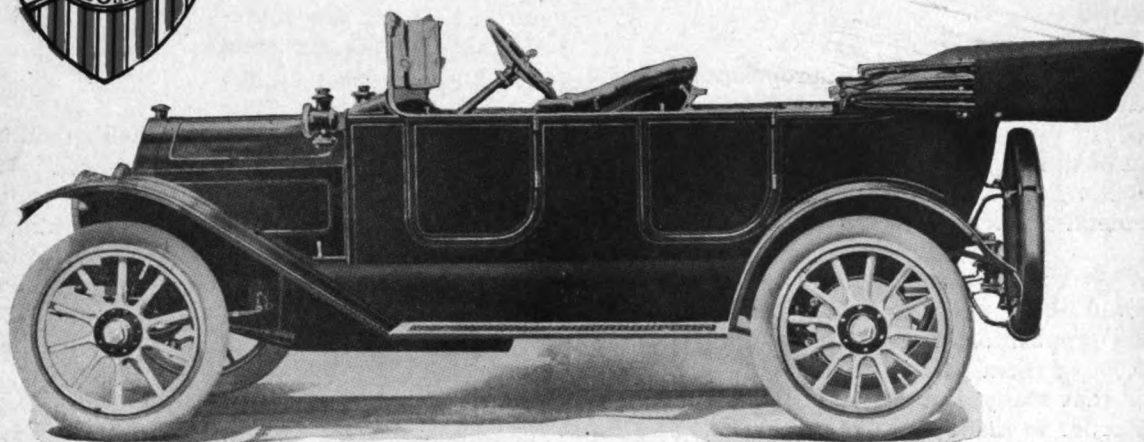
One thing is certain—you as a dealer can appreciate that the big, beautiful six will give class to the entire Maxwell line. The owner of a Maxwell, no matter of which model, will be proud to say he owns a Maxwell. We are not dealing with verbiage, nor using superlatives unnecessarily, because we are talking to practical men—to dealers who are accustomed to handing out enthusiasm themselves and who naturally discount everything they hear. But we want to say to you that we believe there is no other six-cylinder motor in any car, at any price, that is as well balanced or as sweet running as this six. With the full floating rear axle which we recently put under this car it is a perfect product—or as nearly perfect as engineering skill and manufacturing care can make it.

By the way, you, as the man who has to stand between the factory and the ultimate user, will appreciate this—if you did not know it before: When we found that the axle under the "50-6" was too light to hold the motor—driving pinion not strong enough, and not enough room in the housing to put in a larger one—we replaced without request, and entirely at our own expense, every rear axle under every "50-6" car that was out.

That is a mighty important point for a dealer to consider. It shows what our policy is going to be in the matter of standing back of our product—no matter which one. What we did for the "50-6" we would do for the "35" or "25" if it became necessary.

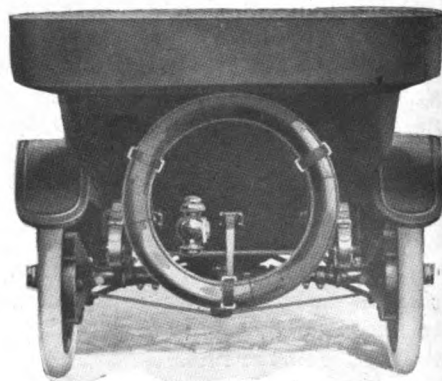
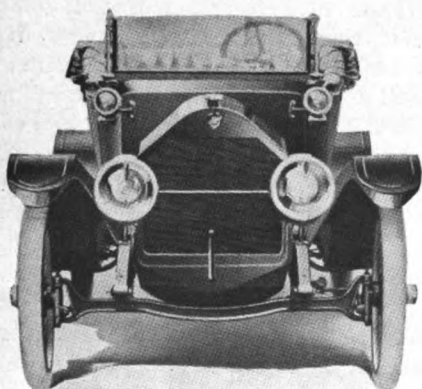
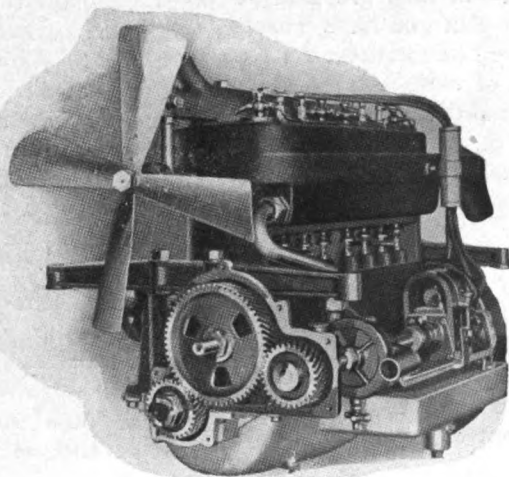
In short, the 4000 dealers who will handle the Maxwell line for 1914 will know first: That every car in the line will be the leader in its class—will dominate its class because it will be a better car for the same or less money than a buyer can find elsewhere, let him shop until he is black in the face. Second: They will know that the policy back of the \$37,000,000 concern that makes this product is based on the assumption that if we are to stay in business, and become the biggest in the business, we must back up our product to the dealer who passes it on to the buyer.





### 1914 Maxwell "35-4"—\$1085—\$1225

Powerful, silent, sweet running; bloc-cast 4-cylinder motor; 111" wheel base; 33"x4" tires all 'round. Left hand drive, center control. Electric starter and lights, at \$1225. Three-quarter elliptic springs. Bruce Ott body, ventilating windshield and full equipment, including Jiffy curtains.







While we will be second largest in the world this year, that does not satisfy us at all. We have got to be first.

Next consider the Model "35." The same wonderful bloc-cast, four-cylinder motor that was in the Everitt "36"—frankness compels us to admit that there was not much else good in that particular car. But that was not our fault. We did not make it. We acquired that proposition primarily to get two of the greatest motors we have ever known—the "50-6" and the "35-4" motors.

You cannot develop an automobile motor in a day—nor in a year—nor in two years. We have bought that knowledge with hundreds of thousands of dollars and years of experience. So we took these two wonderful motors, and we built a car that was as good all the way through as the motors themselves—the Maxwell "35-4" 1914 model which will sell at \$1085 without, and \$1225 with electric self-starter and lights, cannot be equaled anywhere else at the price.

Oh, yes, we know all about it: There are other cars of similar rating, horsepower, wheel base, and all that sort of thing, but we don't need to tell you, as a practical dealer, where the difference is. You will lift the hood and find it for yourself. If you don't find it all there, you will take a look inside the transmission case. You will find it in the beautiful body, designed by Bruce Ott. Made and trimmed as they do not make and trim bodies in the ordinary \$1200 class. We do not need to tell you the tremendous difference in cost of making a bloc-cast motor, such as this, and one with single or twin-cast cylinders.

We do not need to tell you. You know.

To let you into a little secret, our engineers started some months ago to redesign this motor so as to take \$150 out of the making and bring it down in price so as to compete with other cars that, looked at superficially, might be considered competitors—cars that, being made cheaper, can afford to be sold cheaper. There was a riot when our dealers heard of this. Our Sales Manager joined in with them and soon became the ring-leader. All protested against the slightest change in this splendid motor. And Mr. Flanders agreed.

Every man who has handled this car, or sold it, knows that such a motor is vastly more expensive to make—but it's worth it because when it is once made it is made for keeps. There is almost no limit to the life of a well-designed, well-proportioned bloc-cast motor. Being machined as a unit, everything has to be in line—and crank-case and cylinders being cast in a unit, everything has to stay in line. So you see we have another dominating car in our "35" model.

We won't have to ask you to take a few cars of this model in order to get the other—the customer who wants a car in the \$1200 class will, after looking them all over, insist on this one—and you will simply supply his demand.

And now the wonderful Maxwell "25"—the car you have all been looking for, hoping for, and wondering why some big manufacturer did not make.

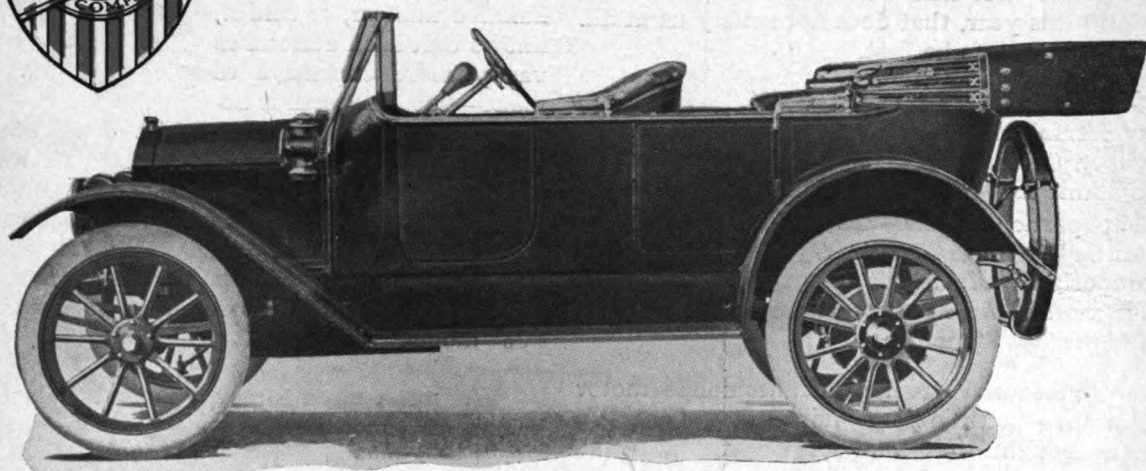
Much as you know about this business, you probably did not know that the first requisite was manufacturing facilities and millions of dollars capital. On top of that, it involves the greatest engineering feat known to the industry.

Why, it's child's play to design a \$5000 automobile. If you doubt it just look back over the past and recall the hundreds of \$5000 cars you have known. They came and went—mostly because the demand for such a car was too little—and you have doubtless noticed it is getting less and less every day.

Cars like the Maxwell "50-6" at \$1975 put a crimp in that kind of proposition. The maker of a \$5000 car is on the defensive today. It's up to him to prove he has a better car. Most of them have given up trying to prove it—and built a smaller car. But they still try to get a high price for a former reputation. There's going to be some real fireworks along that line during the next few months—just watch the Maxwell "50-6."

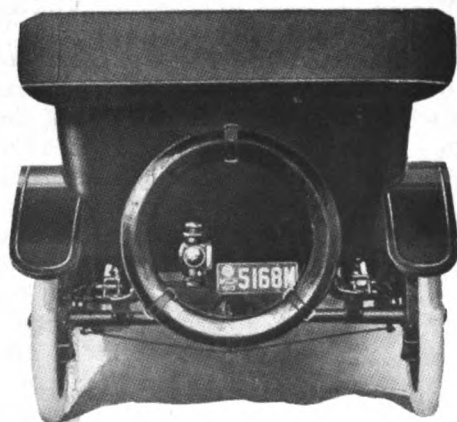
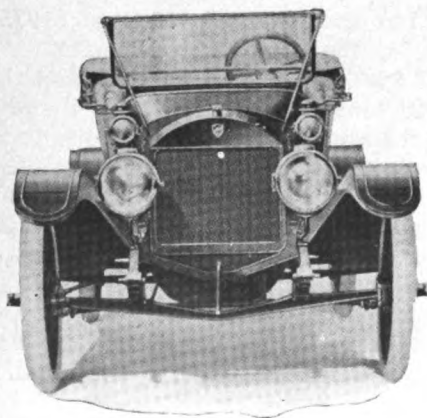
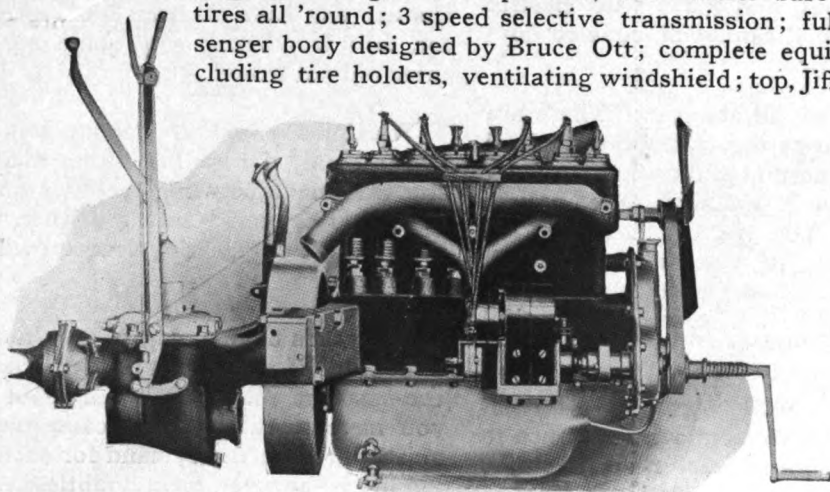
But we were talking about the "25." Funny how we will get discussing one of these models





### 1914 Maxwell "25-4"—\$750

The year's sensation. Four-cylinder, bloc-cast; 25 h. p. motor; magneto; weight, 1600 pounds; 103" wheel base; 30"x3½" tires all 'round; 3 speed selective transmission; full five-passenger body designed by Bruce Ott; complete equipment, including tire holders, ventilating windshield; top, Jiffy curtains







and slop over on to one of the others. You see we are very enthusiastic about the whole line—each one is King in its own Principality.

We were saying it was child's play to design a \$5000 car—do you know that there is only one maker in the world who has ever been able to make a good cheap car?

No, we're not advertising the other fellow—we are just telling the truth.

We did not start out to make that kind of a car. You have told us—thousands of dealers have told us—that there were hundreds of thousands of people who were willing to pay a little more for a car that was a lot better.

A real automobile, in which the people in the tonneau did not have to rest their chin on their knees.

One that a six-foot man could drive himself without having to make a chauffeur of his four-foot-eight son.

It's funny, but seems as if more big men buy more low priced cars than any other price, so we figured that the seats had to be standard size, to fit the buyer. On top of that it had to have power plus—because you know a car like this is criticised more rigidly than a \$5000 car. To the buyer of a \$5000 car, the deal is an incident in the day's work. To the man who buys a car like the Maxwell "25" at \$750, it is a mighty important matter. He not only must consider first cost, but to a still greater extent, must he consider maintenance cost afterward. "Design for that quality as the first consideration," said President Flanders to our engineers.

Such a car must be light, and it must be strong. It must withstand anything it runs

up against. Consequently it must be made of the best materials the science of metallurgy knows how to put into it.

And finally, it has to have style and finish—because you know we are building this car for a class of buyer who, like the average American, detests a uniform and refuses to wear one even if it does cost less than regular clothes. That's the kind of car we have made in the Maxwell "25"—and we won't have to insist on your taking a carload of these in order to get a six or a "35." You will want this car on its own merits, too.

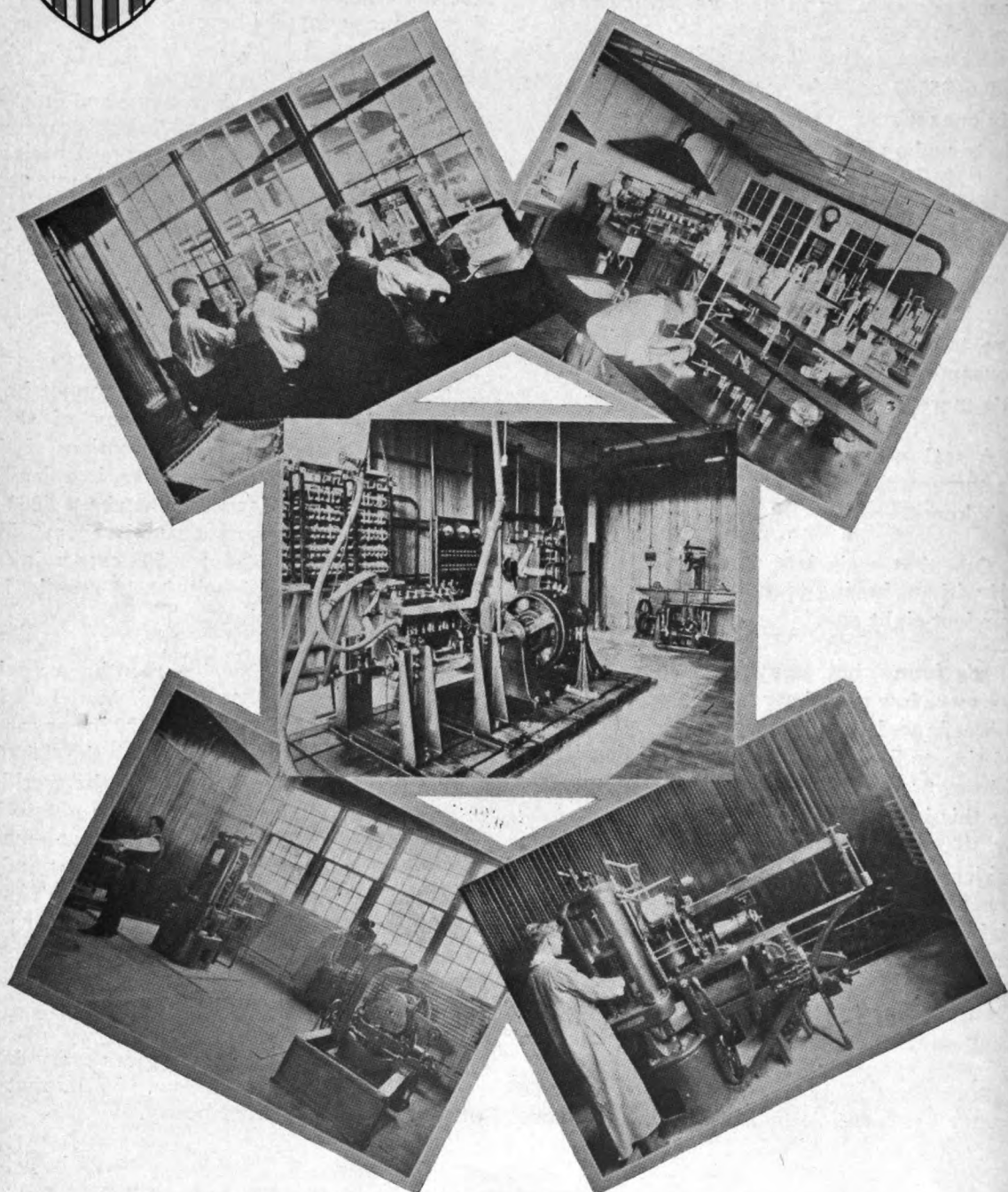
Now just a word more: We cannot hope to supply the full demand for any of these models—with the possible exception of the "50-6," which, as we stated above, is a flexible proposition. If the demand runs above 6000 of these, however, we cannot supply them. We are laying out our plants for 500 cars a day of the model "25"—but it will be 18 months before we reach that point.

During the next twelve months we will, however, make 30,000 of the Model "25"; 12,000 of the Model "35" and 2000, or as many more as you want up to 6000 of the "50-6." That makes us second largest in the world—but that doesn't satisfy us. We've got to be first. There is only one way to do that—make better cars at the same or lower prices; and—stand back of the product and the dealer. That's the only way we know and, again, we refer you to our policy, not as we speak it, but as we proved it in our acts in regard to the Maxwell "50-6."

Such a policy once known gives every dealer confidence and enthusiasm. Well, that is the Maxwell Company's policy.

**MAXWELL MOTOR COMPANY, Inc.**  
**Detroit, U. S. A.**





Some views in the Maxwell Laboratory where we analyze, specify and test every piece of material that goes into any Maxwell Car.



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OCTOBER ISSUE**



**Electric Vehicle and  
Engineering Edition**

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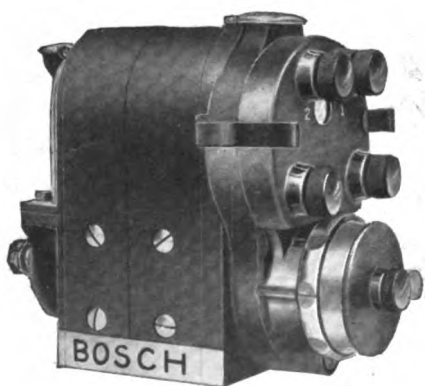
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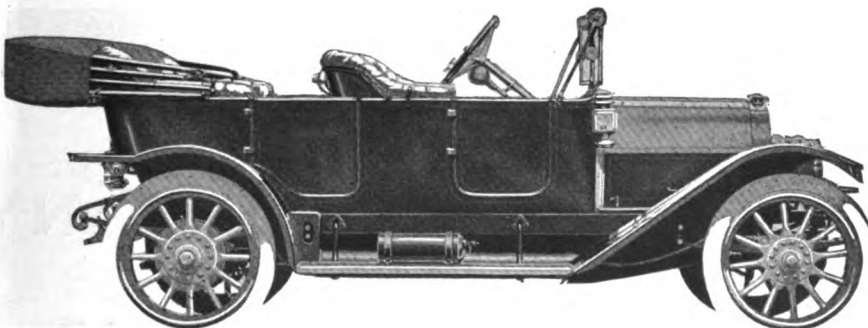
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1914

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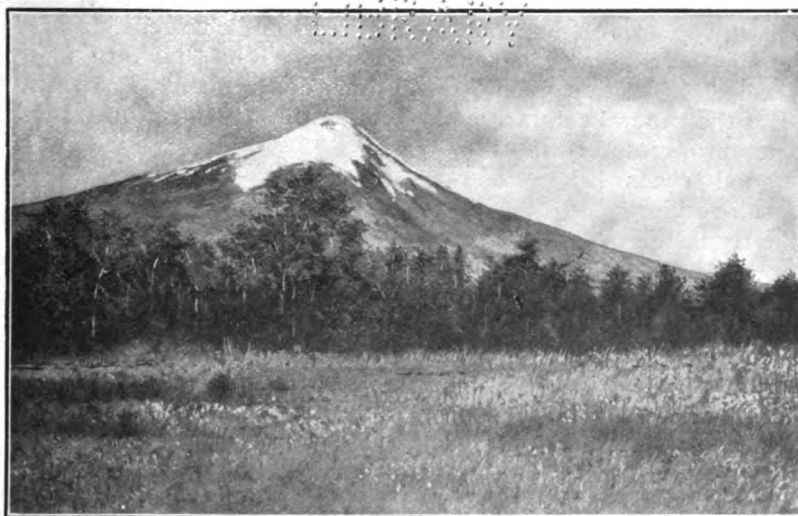
AUGUST 10, 1913

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## ROAD CONDITIONS IN SOUTH AMERICA.

**People Recognize That Commercial Progress Is Dependent upon Improved Transportation Facilities---Investigations Indicate That Constructive Effort Already Is Under Way---Automobile Journeys in Brazil and Argentina.**

EUROPE was compelled to build good roads for use in times of war, long before the advent of the railway, and when the people turned their attention to commerce they immediately began to reap the benefits of this highway system. In the United States the subject of improved ways is only just beginning to receive the attention its importance deserves. The country expanded largely only as railways went ahead of settlement and civilization. The value of good roads is best understood when



Mount Osorno, Chile, Possesses a Charm Exceeded by but Few of the Snow Capped Peaks of the Entire Andean Range.

comparison is made with what may be regarded as primitive conditions, and it hardly will be denied that such conditions obtain in the South American republics.

Few Americans (reference being had in this connection to the residents of the United States) are at all familiar with South America. They may be aware that the cities on the seaboard compare favorably with the best in any other section of the world. Some have visited Rio de Janeiro and Sao Paulo, in Brazil, for instance, and perhaps a single coffee or rubber plantation, and come away confident that they are in a position to judge of the possibilities. However, it must be admitted that a trip into the interior is necessary in order to discover the real agricultural and mineral wealth of the land. Such an excursion is especially valuable when the services of the railroad are dispensed





**Well Kept Streets in Pouso Alegre, State of Minas Geraes, Beautifully Situated in Well Developed Agricultural District.**

with and the visitor makes his way over the country roads and through the villages not yet reached by it.

There are still large portions of the earth's surface which remain undeveloped, but none is so large or so fertile, or shows such extraordinary future promise as the interior of Brazil and Argentina, according to those who have had the fullest opportunity to gain intimate knowledge of the situation. Although a large portion of the former country lies within the Torrid Zone, the moderate elevation renders the climate temperate and delightful, and these favorable climatic conditions, combined with a well distributed rainfall, which also applies in no small measure to Argentina, have made this section a land of unrivalled fertility. But the general commerce of Latin America will not progress as it should until good roads thread the country, sub-serving, in a local stimulus, the trunk railways that are opening the interior of every republic.

This view of the situation was accepted by South Americans less than three years ago, when the first attempt was made to study the road conditions in the interior. At that time pleasure automobiles were to be found in increasing numbers in the cities along the coast, and taxicabs were abundant in Buenos Aires and several of the larger capitals. Business vehicles also were beginning to play their part in the

development of commerce in the immediate vicinity of these centres.

Since that time, much progress has been made. Few organizations have had a wider influence in this regard than the Touring Club Argentino, which has been engaged in routing the entire section with the primary object of interesting the populace in good roads. Incidentally, this body will seek to interest tourists in visiting those districts which present scenic grandeurs as yet but little understood, so that in the end the pleasure vehicle will have had no small influence in the construction of highways that shall be utilized with profit in the transportation of

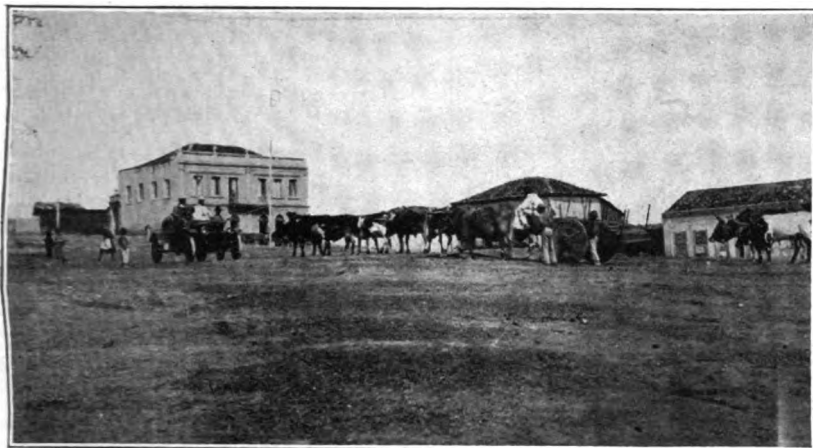
agricultural and mineral products. Manufacturers of both pleasure and commercial cars will be interested, since there is little doubt that South America is soon to offer a substantial market for the motor truck.

The Pan-American Union, with headquarters at 17th and B streets, N. W., Washington, D. C., is an international union of American republics, the main object of which is to disseminate information concerning the possibilities of Latin America in a commercial way. The governing board is composed of the secretary of state for the United States, and the ambassadors, envoys, ministers and charges d'affaires accredited to this country. John Barrett is director-general and Francisco J. Yanes, assistant director. Each month the organization issues a bulletin, under



**One of the Best Country Roads in the State of Minas Geraes, Brazil.**





Old Fashioned Ox Cart with Solid Wooden Wheels at Monte Siao, State of Minas Geraes, Main Transportation Equipment in Interior of Brasil.

the editorship of Franklin Adams, to whom The Automobile Journal is indebted for the information contained herein.

In October, 1910, an automobile was shipped by rail from Sao Paulo, capital of the state of that name in Brazil, to Atibaia, about 48 miles distant. From this point an excursion lasting 23 days was made, covering some 310 miles in the states of Sao Paulo and Minas Geraes. The object was to investigate at first hand the road conditions and their bearing upon the transportation of goods from this district.

The roads in Sao Paulo were found to be suitable only for bullock carts. In one place the way was so steep and slippery, on account of the mud, that it took about two hours to cover 50 feet, and then it was accomplished only by getting five men to assist the engine by hauling on blocks and tackle fastened to the trunk of a tree at the top of the hill. Usually the roads were very narrow and had a rut about two feet wide and two feet deep on one side. In many instances, where it was found impossible to run with the wheels on either side of this, it became necessary to fill it up entirely with earth. One such rut, 250 feet long, was treated in this manner.

In Minas Geraes, the city streets were found to be well kept up, but when these were left behind the rougher country roads were the only highways. Some of these were passable, but others were so irregular that it became necessary to make them over in places before an automobile could be operated over them.

The smaller streams were forded. Often it was found advisable to leave the highway and cut across country through fields or thin woods, wherever it was possible to avoid trees, rocks and thickets.

The country traversed was agricultural. Its products were coffee, cereals, vegetables and fruits. All of these were transported to market over the roads, as railroad communication was altogether lacking. And while the small interior towns and villages were thus isolated from each other in a measure, they were all brought into close touch

by means of several excellent telephone systems.

Contrasted with this is an account of a trip made in January of this year in company with Governor Eduardo Flordi of Neuquen territory, Argentina, from Neuquen, over the Andes into Chile. It should not be understood that the entire journey into Chile was made by automobile, although the car was driven as far as Bariloche, on the Nahuel Huapi lake, from which point the remainder of the trip to the border was made by boat. It may be added, however, that the Touring Club Argentino has outlined two automobile routes from Neuquen into Chile, one going almost directly west to Paso de Pino Hachado and the other a little more to the south, entering Chile at San Martin de los Andes. The route considered here runs almost exactly southwest, and traverses roads which had not previously been touched by a rubber tire. The conditions revealed in the report of this trip given below shows the importance attached to good roads by



Lake Nahuel Huapi, Argentina, 2428 Feet Above Sea Level, Nestles Among the Cordillera Mountains.





Governor Eduardo Elordi and the First Automobile to Cross the Wilderness Between Neuquen and Bariloche, Argentina.

the agricultural and mining interests today.

The car was rated at 40.5 horsepower, and had a clearance of 14 inches from the axle to the lowest edge of the wheel rim. It was held to be capable of making 50 miles an hour, and proved to be a good hill climber under test. In the machine, besides Governor Elordi and the investigator, were the chauffeur, another man who was an able assistant as well as a good mechanic, and a cavalry soldier whose long experience on the frontier of both Neuquen and Rio Negro (the next territory south) had made him perfectly familiar with the road and who acted as guide when any question of direction or choice of road presented itself. The story of the trip is best told by the investigator. The start was made at 5:30 in the morning.

Less than an hour after leaving the capital we crossed the Rio Limay into Rio Negro by means of a simple ferry boat suspended from an iron cable stretched over the river, which was shuttled back and forth by the action of the current. Then we struck the hard and well beaten road through the desert, barren as Arizona, but marked as a passage for oxcarts through the peculiar vegetation of a waterless plain. I cannot refrain from again remarking the close resemblance to Arizona, Texas, or north Mexico. Yet I missed the various formations of the cactus that is universal in those regions; I do not know whether the cactus grows in Argentina, but I am sure that the soil is fitted for it, and Governor Elordi told me that he had plans to introduce in Neuquen a thornless variety, which should thrive in this neighborhood and furnish good nourishment, for the mule especially, and probably for other cattle.

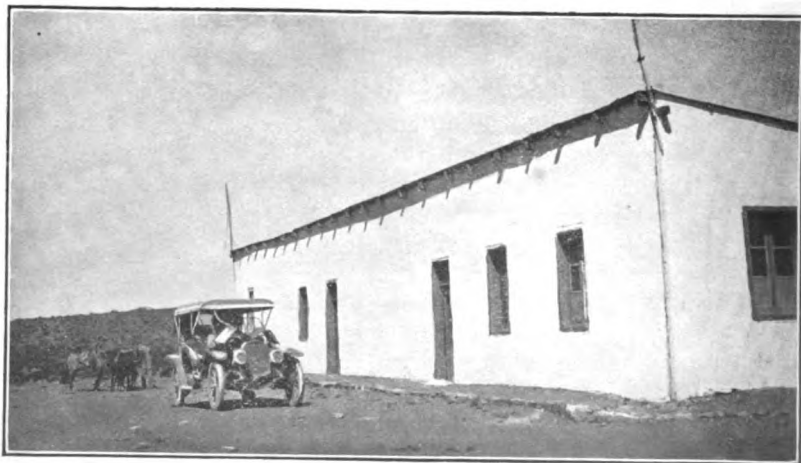
By 9:15 in the morning we had reached (los) Jaguelitos, a boliche, (a small house in the country at which refreshment, chiefly liquid, and small supplies may be purchased by the traveler,) the first one on the road south of and distant 16 leagues from Neuquen. (A league in Argentina is equal to five kilometers, or 3.107 miles). Here we rested awhile and tasted the water from the well that offered the excuse for the erection of the house of the proprietor. As proof of a fact that is becoming better acknowledged in all regions of this na-

ture, the soil, when watered from the well here, was quite fertile, and the proprietor was growing garden vegetables sufficient for his own needs.

The monotony of our journey through this section was frequently broken by the sight of game which would have aroused the interest of a North American sportsman. Several guanaco, the species of South American camel which is very closely related to the llama, were seen, while ostriches were quite numerous. Partridges and hares also abounded. The killing of ostriches is forbidden on many of the large estancias of Argentina, their feathers being a source of considerable revenue to the owners. These feathers are not as fine as those of the African ostrich and are chiefly used to make feather dusters.

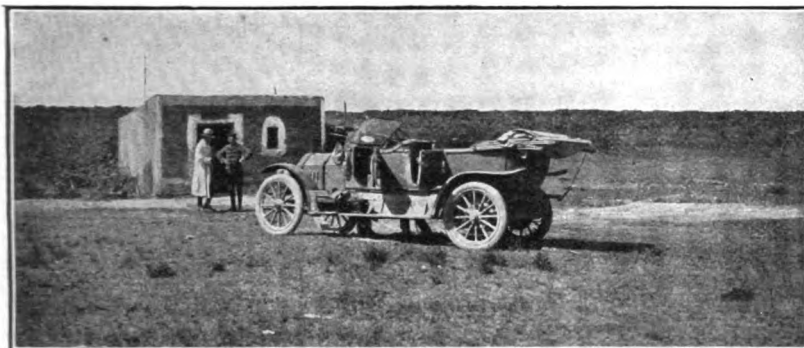
Leaving Jaguelitos at 10 we gradually descended into a broad valley, the road giving practically no difficulty for the machine, so that it travelled easily at the rate of six leagues (18.5 miles) an hour, and even more in places. We reached another boliche—not far from a curious hill at the end of the valley, called El Cerro de la Policía—at 11:30, and here we rested and took a comfortable breakfast, furnished by the owner. Again an instance of the productivity of the soil, for this settler had discovered six years ago a spring of pure water on the side of the hill back of his house and had developed a practical system of irrigation for a garden around his home; in this he was growing luxuriously corn, onions, potatoes and similar vegetables, while his esthetic taste had led him to cultivate flowers, so that as we departed he gave us a handful of pinks (claveles), which preserved their freshness and fragrance even to the end of the following day.

It was hot in this valley, the thermometer registering 32 degrees centigrade, at midday, and no air was stirring; so we were glad to start shortly after 3 in the afternoon and catch the breeze created by the movement of the car. A good road past the Cerro brought us to another boliche named Colorado, within an hour, a distance of seven leagues (not quite 22 miles). Here Governor Elordi had had stored and ready for immediate use a quantity of petrol (gasoline), for as the road had never been travelled before by an automobile, it was necessary to provide fuel along the way, in case of need. At Colorado we stopped only long enough to transfer the gasoline to the car and then hurried on through the valley (canadon) called Tricaco. At 6 in the evening some bad road was encountered in another valley, and the next two hours made slow going, but from 8, under a brilliantly starlit sky, we hurried on again, making the night's resting place—Mencue, a good sized warehouse and store for the surrounding estancias—at 10:10, having



The Building at Pilcaniyeu Utilized by Argentine Government as School-house, Telegraph Office and Postoffice.





The First Bolliche South of Neuquen, Where Party Stopped for Rest and Refreshment.

covered this last interval, 22 leagues (68.35 miles), in three hours and 40 minutes. The entire distance travelled during this first day of the machine was therefore 55 leagues (171 miles), and by taking a short cut here and there, under the direction of the guide, we had saved about five leagues (15.53 miles) out of the 60 leagues (186.41 miles), the ordinary cart distance estimated by the natives.

Mencue is said to be the half-way station between Neuquen and Bariloche, but the longer half lay behind us, and according to the reports of those who knew the road, in reality the worst half. As we had a late supper the night after arrival, there was no great haste in the morning's start, so we did not leave the "casa de negocio" till 8:50. The night had been cold and the morning air was fresh and invigorating, the thermometer registering 16 degrees centigrade at 6 in the morning. This is accounted for by the fact that the altitude, as recorded by my aneroid barometer, was close to 1200 meters (3937 feet), the highest point on the road. (This elevation varies only slightly from the more accurate calculation for Mencue, given us later by the chart at Bariloche.)

Leaving Mencue we found an excellent road to a bolliche named Laguna Blanca, on account of a small lake near by, which dries up in the summer to expose its bed incrustated with a glistening white salt of some kind. The distance of 10 leagues (31 miles) was covered in 50 minutes. From Laguna Blanca to another little oasis in the wilderness called Cumallo is 14 leagues and required two hours and 45 minutes, our arrival being at 12:45. Here we had a stand-up breakfast, Governor Elordi deciding to spend no time in resting, although the cottage was attractive and, with water from a hill at the rear, was shaded by a pretty grove of trees.

From Cumallo, which we left at 1, to Pilcaniyeu is eight leagues (above 25 miles), and we arrived at 2:45. This place is quite a village, having a national (federal) school, a telegraph station, and a well organized industrial plant, with modern machinery for sheep shearing. In all the valleys in this vicinity flocks of sheep are numerous, and the industry seems to thrive. Pilcaniyeu is the dividing line for the eastward traffic, because from this point all carts from the south strike directly eastward toward the end of the railway that begins on the Atlantic coast at Puerto San Antonio in Rio Negro, and great hopes are expressed that within a short time this railway will reach Pilcaniyeu and even be continued to Bariloche. North of Pilcaniyeu, most of the traffic goes to Neuquen, but as that is the nearest town of any importance on a railway having connection with Bahia Blanca and Buenos Aires, it furnishes most of the supplies needed in this entire region to the south.

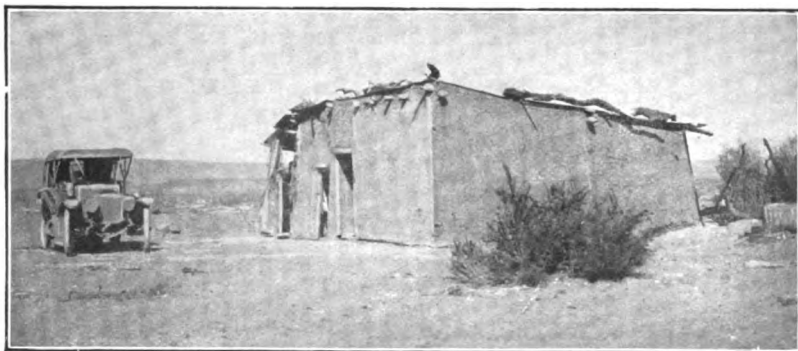
Leaving Pilcaniyeu at 4:15, after a simple meal, we found many irregular spots in the road, due to the more frequent passage over it of many carts, and also to the difference in the soil, which was more earthy and consequently these heavy carts made deeper ruts, with a high and awkward hump between them. These humps in the middle of the road

caused many a delay and detour to avoid them, and progress was often slow on that account. About 5 we caught the first clear glimpse of the snow capped Cordillera, and shortly afterwards, the beautiful saddlelike peaks of mighty Tronador rose before us. During the afternoon, too, we had noticed a better and greener landscape, more cattle (horses chiefly), richer valleys to right and left of the highway, and more frequent dwellings than had been visible the day before. A well established civilization was coming into existence along the road. At 6:30 we entered the Rio Nirihuao (and here we remained for some time; but that is another story which had best be given by Senor Elordi if ever he seems inclined to tell his experiences), and at 11:30, over a splendid road which allowed us to travel, even in the slender illumination of the stars, at the rate of some 40 kilometers (25 miles) an hour, we entered the town of Bariloche, tired but victorious. We had made today just 50 leagues (156.34 miles).

In Bariloche we remained during the early hours of the day, partly to rest, partly to visit, and practically because nothing could be gained by attempting to hurry across Lago Nahuel Huapi, on which the town lies. The lake itself is beautiful, and deserved the hours we spent on it, as its shores are lined with pine-covered hills, and toward the west the snowy Cordillera is always in view. But the steamer (specially engaged for the occasion) was ready for us at 4 in the afternoon, and we then continued the trip to the farther end, arriving at the landing place of Puerto Blest at 9:30 that night.

Puerto Blest we left at 4 the next morning, traversing the short interval between Lago Nahuel Huapi and Lago Fria, only four kilometers (2.5 miles) over a slight wooden-railed tram, in 40 minutes. Lago Fria (not Frio, because the name does not indicate the temperature of the water, but that of its early investigator) is a deep pocket in the mountains, with precipitous sides, allowing admittance only at the two ends where the company has placed landing stages. We were rowed across it in a small boat, a distance of 10 kilometers (6.21 miles), leaving one end at 4:50 and arriving at the other at 5:30. We left the little lake at 5:50, on muleback to cross the divide between the lakes and on the way to leave Argentina and to enter Chile, for we passed the boundary line at 6:45, three kilometers (1.86 miles) from Fria. A distance of six kilometers more brought us to Casa Pangué, on the edge of the Rio Peulla, up whose valley a splendid view of Tronador is obtainable. Then a wagon ride of 17 kilometers (10.56 miles) through a forest of pine and other timber, following the Rio Peulla all the way, brought us to the hotel at Peulla on the shores of the Lago Esmeralda, where we arrived for breakfast.

Leaving Peulla at 2:30 in the afternoon we steamed across Lago Esmeralda, 50 kilometers (31.06 miles), coming closer at every turn to beautiful Mount Osorno, which raises its snow peaked cone above all the surrounding landscape, and landed at Petrohue at 4:30. Here horses were already waiting for us, and with only time for a cup of coffee we were away for Ensenada, 18 kilometers, at one



The Bolliche at Colorado, Where the Governor Had Deposited a Supply of Gasoline.



end of Lago Llanquihue, the largest lake in Chile and second only to Titicaca in South America. We arrived at 7:15, took supper in the hotel at Ensenada, and left by steamer at 9 for Puerto Varas, 50 kilometers across the lake and the nearest station on the Central Railway of Chile, arriving at 12:30 a. m. (Argentine time, but before midnight Chile time).

From Puerto Varas there is only an afternoon train running no farther than to Osorno, about 58 miles. Through connection with Santiago has been established for some time, but the line to Varas, being recently opened, is at present only for local traffic, and consequently the traveller must spend the night at Osorno, and we had to go to a hotel to wait for the through train in the morning. We left Osorno at 5:50, being lucky enough to find a sleeping car (dormitorio) to carry us all the way to Santiago.

Bariloche is a village in Argentina, from which cart roads with a simple commerce extend toward the north to San Martin de los Andes, toward the northeast to Neuquen, and toward the east to the present end of the railway coming westward from the Atlantic port of San Antonio. The completion of this railway will bring all this beautiful east Andean region into touch with the populous area of the republic. A railway is building to the west and north from Neuquen, its ultimate destination being into Chile. In the neighborhood of Bariloche, however, great industrial progress is expected, while it offers attractive possibilities for the farmer, the rancher, and the lumberman. It lies on Lake Nahuel Huapi at an elevation of 740 meters (2428 feet). The shores of this lake are thickly forested, and already some settlement has begun to make itself felt.

The narrow arm of Nahuel Huapi, up which the little steamer runs to reach the westernmost shelter, offers a wonderful stretch of scenery, comparable in many respects to a fjord of the Norway coast. In most places the sides fall sheer into the water from a height of hundreds of feet above. Old Indian remains are known to exist here, and it is a tradition that the Araucanians knew of the pass from the lake across the Cordillera. Certainly the waters of the lake offer the only highway,

because to get at the eastern shore in any other manner than through this arm demands a body and nerve racking detour through the wildness of pine forest that clothes those rocky eminences. Eternal snows cover the higher peaks of the inclosing mountains, while an occasional glimpse of Tronador—3600 meters (11,811 feet)—can be caught to the southwest.

Laguna Fria is so still and shadowful in its deep mountain basin that even talking seems a desecration, and the rhythmic dip of the oar is the only sound expected or tolerated. It lies 10 meters (32.8 feet) above Lake Nahuel Huapi, but its waters flow eastward, the watershed between the Atlantic and Pacific, and consequently the boundary between Argentina and Chile, being found at an altitude of 1050 meters (3445 feet), three kilometers west of Lake Fria. From this cumbre, as the pass over the divide is called, the descent is rapid to the bed of the Rio Peulla, only 320 meters (1050 feet) above the level of the sea. This river hurries on to the Pacific as if it bore the burden of all the snows of the Andes; its waters are therefore not navigable, but the good road along its shores, built through the woods, adds a change to travel. The snowy mountains are occasionally glimpsed through the trees, and at one place we passed not far from a pretty waterfall over the side of the cliff.

Lago Esmeralda receives the water from Rio Peulla. The lake itself is a considerable body of water. It differs noticeably from Nahuel Huapi, because the sides are usually less precipitous, while sandy shores and beaches are quite common. More settlement is discovered in the bays and sheltered spots. Great charm, however, is given it by the fact that two lofty cones of Puntlagudo and Osorno—called volcanoes in the Spanish, although there is little activity left in them—are now plainly visible. They present an interesting contrast, the one being, as its name implies, a sharp, toothlike projection into the blue sky, the other rising gently and very evenly from all sides into a smooth and well rounded summit. There is an agreeable hotel on its shores, and the traveller can have many worse experiences than to pass a few hours or days in it.

## SIMPLEX DEFEATS PEUGEOT.

### Louis Disbrow Takes 300-Mile Carnival Sweepstakes Event at Galveston.

The chief event at the beach meet, Galveston, Tex., July 28-30, was the 300-mile carnival sweepstakes, run in three divisions, 100 miles each day. At the end of the first section Louis Disbrow in the Simplex Zip was ahead, his time for the distance being 1:23:59.48. Chandler in a Mason was second and W. Endicott in a Case third. After running the second division Ferguson in a Peugeot had lowered Disbrow's time of the previous day, covering the 100 miles in 1:23:57.3. At that time Disbrow was in second place and LeCain in a Stutz third. It began to look as if the French car would take the event, particularly as at one time on this second day it practically was a whole lap ahead of the Simplex. However, on the third day, all but four of the original 15 entrants failed to finish. The results for the three days follow:

| Carnival Sweepstakes. |                   |            |
|-----------------------|-------------------|------------|
| Car                   | Driver            | Time       |
| Simplex.....          | Disbrow .....     | 4:17:23.40 |
| Stutz.....            | LeCain .....      |            |
| Case.....             | W. Endicott ..... |            |
| Studebaker.....       | Mosely .....      |            |

#### Ten Miles.

|                 |               |          |
|-----------------|---------------|----------|
| Gila.....       | Dewitt .....  | 11:07.85 |
| Studebaker..... | Mosely .....  |          |
| Mason.....      | Mulford ..... |          |

#### Ten Miles.

|             |                |         |
|-------------|----------------|---------|
| Mason.....  | Chandler ..... | 9:07.82 |
| Case.....   | Ulbrecht ..... |         |
| Mercer..... | Horan .....    |         |

#### Fifteen Miles.

|              |                    |          |
|--------------|--------------------|----------|
| Peugeot..... | Ferguson .....     | 11:59.29 |
| Mason.....   | Mulford .....      |          |
| Mason.....   | Rickenbacher ..... |          |

#### One Mile, Flying Start.

|              |                |         |
|--------------|----------------|---------|
| Case.....    | Disbrow .....  | 0:32.10 |
| Peugeot..... | Ferguson ..... | 0:35.14 |

#### Ten Miles.

|            |                   |         |
|------------|-------------------|---------|
| Mason..... | Chandler .....    | 9:09.32 |
| Case.....  | W. Endicott ..... |         |
| Mason..... | Mulford .....     |         |

#### Twenty Miles.

|              |                   |          |
|--------------|-------------------|----------|
| Mason.....   | Mulford .....     | 15:59.00 |
| Peugeot..... | Ferguson .....    |          |
| Case.....    | W. Endicott ..... |          |

#### One Mile, Flying Start.

|              |                |         |
|--------------|----------------|---------|
| Case.....    | Disbrow .....  | 0:31.11 |
| Peugeot..... | Ferguson ..... | 0:34.20 |

**Stutz Wins Santa Monica**—A special dispatch from Santa Monica, Cal., states that the fifth annual Santa Monica road race, Aug. 9, was won by Earl Cooper in a Stutz, his time for the 445 miles being 6:01:52. Barney Oldfield in a Mercer was second, in 6:07:45, and Louis Nikrent in a second Mercer, third, in 6:28:17.2. Fourteen cars started, and five were eliminated before the close.



## INDIANA MAKERS COMPLETE TOUR.

**I**NDIANA money was no good in California upon the arrival in that state of the members of the Indiana Automobile Manufacturers' Association on their transcontinental tour. As soon as they crossed the border they were taken in charge by a committee representing the chambers of commerce in the principal cities of the state, and during the journey from Lake Tahoe to San Francisco, the stay in the latter city, and the trip down the coast to Los Angeles, rooms, beds and meals were provided. The reception accorded the Hoosiers in the Golden State was a fitting climax to one of the most interesting and important automobile tours yet held.

As stated in the last issue, the stay in Salt Lake City was cut from two days to one, on ac-

a misunderstanding of the routing directions, a circumstance which can readily be understood by those who have crossed the Nevada desert, the party was sent over Dugway pass, a grade that no car had attempted during the past three years. It was a long, steep grade, averaging 18 per cent., and many of the cars found this by far the most difficult portion of the journey, the heat and the sand in nowise contributing to the easy accomplishment of the task. Once over the pass the tour entered an alkali plain for the remainder of the distance into Kearney's, where the tents were pitched in the rain.

Half-way between Kearney's and Ely (125 more miles of desert) the Premier truck, carrying a supply of United States tires, which had



**Members of the Indiana Automobile Manufacturers' Association on Indiana-Pacific Tour Received by Gov. Spray of Utah at Spanish Forks, Utah.**

count of the delay caused by the cloudburst near Thompsons, Utah. Consequently, the side trip to Ogden was omitted. After bathing at Salt Air beach, hearing a grand organ recital in the Mormon tabernacle and enjoying a banquet, at which good roads and the proposed Lincoln highway were discussed once more, the tourists left for Kearney's ranch, Nev.

Some desert had been encountered before Salt Lake City was reached, but that was as nothing compared with the dreary waste of sand some 172 miles wide before reaching the oasis at Kearney's. Harlow Hyde, advertising manager for the Empire Automobile Company, in the Empire 19, which acted as pacemaker that day, declared these roads to be the worst in the universe. In this opinion there was little disagreement on the part of the other tourists. Unfortunately, due to

stopped to aid a local car, suffered its first accident. The men in charge were forced to wait for assistance, and when night came rolled themselves up in blankets and climbed behind the grated doors on top of the tires. Sleep proved impossible because of the cries of the coyotes. It was not until the next evening, 18 hours after they became stalled, that help arrived. After a hurried trip to Ely and back to the truck, when repairs were made quickly, the crew set out to overtake the remainder of the party in Lake Tahoe, Cal., nearly 400 miles distant, 48 hours later.

From Ely, the tourists went to Goldfield, by way of Tonapah, 211 miles, which was covered in approximately 12 hours. At Hot Springs ranch, near Tonapah, Gov. Ordde of Nevada greeted the tourists and made a short address at the luncheon tendered the visitors. Forty





**The Kerosene Henderson Leading the Hoosier Caravan Through the Desert Lands in Nevada.**

miles east of Tonapah, the Pathfinder met with difficulty, and the driver was forced to spend 14 hours before the arrival of the relief car. However, he had succeeded in making the necessary repairs by this time, and elected to reach Lake Tahoe by way of the Fallon sink and Reno. Heavy rains had destroyed portions of the roads and in places it was necessary to drive on the railroad ties. The Pathfinder rejoined the others at Lake Tahoe on time.

The big redwood forest between Goldfield and Casa Diablo, where the next night stop was made after visiting Bishop, Cal., offered a pleasing relief over the days spent in the alkali deserts. Fifty miles out of Goldfield the state line was crossed, the site being marked by a flagpole bearing the United States and California flags. Here the party was met by a delegation from the Inyo Good Roads Club of Bishop and escorted over the White mountain pass through narrow canyons where the road lay in the dry bed of a creek, to the top of Westgard pass with its 10 per cent. grade, then down through rocky gorges, but over one of the finest roadbeds of the entire trip, the route of the pony express from the eastward in the old days.

Upon leaving Bishop good roads were traversed for 25 miles in the valley, until another mountain pass was reached.

Next came a government reserve in the pine forests and more canyon roads, until camp was pitched at Casa Diablo. Here supper consisted of a large portion of some 500 trout caught by five men, who explained that it had been a bad day for fishing. Casa Diablo signifies "The Devil's Castle," and is so named because of the presence of a boiling hot geyser, around which sulphur smoke escapes from the rocks.

Soon after leaving camp the next morning the summit of the Sierras was passed, and then came a gradual descent into Carson City, Nev., through a succession of mountain passes and

fertile valleys. During the day the tourists passed Mona lake, a body of water one-fourth solid, so saline that no vegetation appears on its shores.

From Carson City to Lake Tahoe, back over the California line, the tourists were required to make a 12-mile climb up King's canyon to an altitude of nearly 8000 feet. This brought them to Glen Brook, from which point a ferry conveyed them across the lake to Tahoe tavern. Here the Hoosiers were met by the California reception committee, and the remainder of the journey into San Francisco was a grand triumphal procession. Another big banquet was held at Lake Tahoe.

July 26 the cars were again ferried across the



**Hoosier Tourists in Camp at Kearney's Ranch, Nev., After Crossing Dugway Pass and 172 Miles of Alkali.**





**Elwood Haynes, Pioneer American Gasoline Automobile Inventor, and Gov. Ammons of Colorado, at Denver.**

lake, from which point they climbed over High Summit, at an altitude of 7400 feet, and began the long descent to the coast. At Sacramento, the night stop after 140 miles, Gov. William Johnson of California gave a public reception to the tourists.

The Pacific was reached at Oakland about 5 Sunday afternoon. Thousands of motorists from Oakland and San Francisco met the tourists and a large escort from Sacramento, on the way, and this portion of the long journey was ended amid holiday scenes. The contrast between this grand parade and the struggles in the alkali desert earlier in the week, to say nothing of the difficult passes over the Continental Divide, seemed a fitting celebration of a victorious band of motorists which had conquered roads never before attempted in a transcontinental tour of this kind.

In connection with the arrival in San Francisco July 28 was the appearance of a 1914 Cole, an engineering test car from the factory of the Cole Motor Car Company, Indianapolis, at the reception tendered the Hoosiers, Monday evening. The Cole company had decided not to take part in the tour, because of its inability to secure a machine on time for the start, July 1. The test car was placed in charge of Chief Engineer Charles S. Crawford the morning of July 12, and he left immediately for Chicago. The route westward was across Illinois, Iowa, Nebraska and Wyoming into Salt Lake City, where it picked up the route

taken by the others. It was delayed a half day in Chicago and a whole day in the desert country. Rain was experienced each day after leaving Omaha, with the exception of the last.

The tourists were a day late getting out of San Francisco, on the last leg of the journey into Los Angeles, leaving Friday, July 31, instead of Thursday, as originally planned. The trip down the Pacific Coast was without special incident, except for the popular reception in each city and town. The tour ended, after 3766 miles, at 5:30 Sunday afternoon, Aug. 3, when the party was escorted into Los Angeles by hundreds of California motorists.

The results of the trip will be awaited with interest. Throughout the entire distance the Haynes entrants, in charge of Elwood Haynes, pioneer gasoline automobile inventor in America, were examined with special care. Mr. Haynes became a decided hero in the Far West, and was kept extremely busy reciting his early experiences, back in 1893, when he was trying his best to get a gasoline motor to propel his first crude vehicle. Ray Harroun and his Henderson 3, with its kerosene carburetor, also claimed their full share of interest, after crossing the great American desert at the head of the column without mishap. The Empire, the smallest car in the tour, carried Indianapolis air into Los Angeles in three of its tires. Unfortunately, information is not yet at hand to indicate the manner in which the individual cars withstood the long journey, and that must be made the basis of another story. The return to Indianapolis will be made by train at the convenience of the tourists.



**The Marmon Entrant Extricating Itself from an Arroyo in the Utah Desert Immediately After the Cloudburst.**



## GENERAL NEWS OF THE INDUSTRY.

### Harry Fosdick Re-Enters New England Field with Hupmobile--Handley Forms Selling Company--Matheson Goes with Palmer-Singer--Other Changes.

**H**ARRY Fosdick and Frank F. Wentworth, two of the best known men in the industry in New England, have organized a company, with headquarters at 926-928 Commonwealth avenue, Boston, to take over the distribution of Hupmobile cars, made by the Hupp Motor Car Company, Detroit, in New England. Mr. Fosdick recently retired from the Hupmobile factory organization for this purpose, and his association with Mr. Wentworth is expected to increase the sale of this make of car very materially.

Mr. Fosdick is without doubt one of the best informed men concerning the history of the motor car in America. He began his connection



**Harry Fosdick, Pioneer Automobile Salesman.**

with the industry in 1899, when he became associated with the first retail automobile salesroom in the country in Boston. He is best remembered as having introduced the Mobile in that city. Later he established the Boston branch of the Winton, and after serving a number of years as its manager he organized the Harry Fosdick Company, which was interested in a number of foreign importations. He disposed of his stock in this concern to become identified with the Hol-Tan Company of New York City, of which he was vice president, handling the American sales of the Fiat. He also was associated with Vincenzo Lancia in introducing the Lancia car in this country. Some few years ago he became sales manager of the Stevens-Duryea Company, Chicopee Falls, Mass., and left that concern to become sales director for the Hupp Motor Car Company.

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Mr. Wentworth is quite as well known throughout New England, having interests other than in the automobile field. He did much toward popularizing the Overland car in this district, and also was decidedly interested in the sale of American, Marion and other cars.

### PURCHASES CINCINNATI CONCERN.

#### Rock Island Battery Added to Line Made by Manhattan Electrical Supply Company.

The Manhattan Electrical Supply Company, 17 Park place, New York City, has purchased the business and plant of the Rock Island Battery Company of Cincinnati, O., and took possession Aug. 1.

This important move does not mean that the Rock Island brand of dry battery will be discontinued, for it is the intention of the Manhattan company to make it in connection with Red Seal, Hi-Up, Blue Seal and Mesco batteries, now made at the other factories of the New York concern.

### CONTINENTAL BUYS MACHINERY.

#### Took Advantage of Good Business Opportunity Offered by Lozier Motor Company.

As the result of a recent purchase of machinery for the Detroit plant of the Continental Motor Manufacturing Company, maker of Continental motors, a story has been circulated that the Continental company has acquired the Lozier Motor Company's motor making plant. The latter concern has designed and built its own motors since Lozier cars were first built 10 years ago, and will continue to build them in future, according to N. R. Feltes, treasurer of the company.

In explaining the report, George W. Yeoman of the Continental company says: "It is only fair to the Lozier company to kill this rumor before it has had time to spread. What really happened was this: Our Detroit plant was flooded with orders and we were trying to procure some new motor machinery quickly. In this dilemma we were offered a part of the new equipment in the Lozier plant for immediate delivery and instantly purchased it."



**TO SUPERVISE EMPIRE SALES.****Wallace C. Hood Leaves Westcott Company for Indianapolis Concern.**

Wallace C. Hood, formerly general manager of the Westcott Motor Car Company, Richmond, Ind., has been appointed commercial manager of the Empire Automobile Company, Indianapolis, Ind., maker of Empire cars.



Wallace C. Hood, Commercial Manager, Empire Automobile Company.

The constantly increasing volume of business done by the company has made necessary many additions to the organization of that concern, Mr. Hood's being one of the most important to be made recently and one which will please his many friends.

He will supervise the sales and advertising policies of the company and in the triangle composed of Cecil E. Gibson, general manager, and L. R. Wilbur, his assistant, should develop some very profitable sales policies for Empire distributors throughout the world. Mr. Hood is a man of keen ability in the forming and execution of sales policies. He was at one time sales manager of the Chalmers Motor Car Company, and later of the Metzger Motor Car Company, both of Detroit, and is one of the best known automobile men in the country.

**REMOVED TO FRAMINGHAM.****Standard Woven Fabric Company Finds Worcester Plant Inadequate for Its Needs.**

To meet the decided increase in the demand for Multibestos brake lining, standard woven belting and solid multiple hose fabrics, the Standard Woven Fabric Company, which for many years has been located at Worcester, Mass., has occupied its new factory recently built and equipped at Framingham, Mass.

This step was made necessary because the facilities at Worcester had become inadequate to meet the growth and expansion of the business. In the new factory at Framingham is incorporated every modern feature tending to promote quality and economy of production, not only in the company's present line, but additional products which embrace everything in the way of woven fabrics for mechanical purposes.

**BECOMES GENERAL MANAGER.****Clarence H. Booth Assumes Position of Highest Responsibility with Studebaker Concern.**

In the appointment of Clarence H. Booth as general manager of the automobile division of the Studebaker Corporation, Detroit, maker of Studebaker machines, the directors of that company have clearly recognized merit, as it is generally conceded that the promotion was well deserved. Mr. Booth has been closely identified with the expansion of the Studebaker automobile business since its development began.

When the E-M-F Company was making decided advances in the automobile field, Mr. Booth was operating a large independent steel stamping mill at Detroit, known as the Pressed Steel Sanitary Manufacturing Company. The automobile concern needed such a factory for the manufacture of fenders, hoods and other parts, but lacked the time to build a new plant. As a result Mr. Booth's factory became a part of the fast growing Studebaker business.

Mr. Booth retained charge of his old factory and in a short time he was given Studebaker



Clarence H. Booth, General Manager, Studebaker Corporation.

plant No. 3 in addition, with 2500 employees in his charge. He demonstrated his capacity and soon became manufacturing manager of the entire automobile division. Within a year he be-



came assistant general manager and it is from this position that he has taken the position of highest responsibility, that of general manager of the entire automobile business. Within four years the men under his direct charge have increased in number from 1000 to 10,500.

### FORMS SELLING COMPANY.

#### J. I. Handley Combines American and Marion Interests in \$1,000,000 Concern.

From Indianapolis comes the announcement of the formation of a new \$1,000,000 concern, to be known as the J. I. Handley Company, which will own all of the Handley interests in the Amer-



J. I. Handley, President, J. I. Handley Company.

ican Motors Company, the Marion Motor Car Company, the American Motors Realty Company, the A. & M. Sales & Service Company, all of Indianapolis; the American-Marion Sales Company of New York and the American Motors California Company of San Francisco. The

new company is to be the sole

selling agent of the American Motors Company and the Marion Motor Car Company, marketing all American underslung and Marion models.

President J. I. Handley states that this move is to accomplish two purposes: First, it will unify all of his interests in these companies, and second, it will departmentalize more specifically the work of the various units. "With the sales, advertising and service work entirely removed from the manufacturing companies and thrown into another individual company, whose function will be the distribution of the product of both the American and the Marion companies," says Mr. Handley, "we will be able to pursue a more concrete manufacturing programme. In other words, the American Motors Company will have nothing to do but build the famous American underslung models. Similarly the Marion Motor Car

Company will concentrate entirely upon the production of the Marion sixes and fours. Thus the new company will be able to specialize and concentrate all its efforts in successfully distributing and promoting both products."

V. A. Longaker, in addition to continuing as chairman and general manager of the American Motors Company, will also, at the request of President Handley, accept the vice presidency of the new corporation. D. S. Menasco, vice president of the American Motors Company, will continue in this capacity, but will also become president and general manager of the American Motors California Company, with headquarters at San Francisco. J. I. Handley will retain the presidency of both the American and Marion companies.

### MATHESON WITH PALMER-SINGER.

#### Becomes Western Manager in Territory Between Pittsburg and Pacific Coast.

C. W. Matheson, for eight years chief executive of the Matheson Automobile Company, Wilkesbarre, Penn., maker of Matheson cars, has formed an association with the Palmer & Singer Manufacturing Company, New York City, manufacturer of the Palmer-Singer automobiles. Mr. Matheson will be western manager, in charge of the business of the company in the territory between Pittsburg, Penn., and the Pacific Coast.

Mr. Matheson is one of the best known men in the automobile industry, and has long been identified with the manufacturing end. The Palmer & Singer Manufacturing Company recently doubled its factory output and is preparing to double it again within the next 12 months. Consequently the company is now, for the first time, in a position to develop the western territory, which perforce was neglected in the past. That Mr. Matheson is the right man to undertake this task of opening up a virgin territory for the company is attested by his reputation as a business man of exceptional ability.

### TO REOPEN FLANDERS PLANTS.

#### Pelletier Said to Have Organized Tiffany Electric Car Company for This Purpose.

It is announced that E. LeRoy Pelletier, advertising manager and publicity promoter, was the central figure in the purchase of the remaining assets of the Flanders Manufacturing Company, Pontiac, Mich. The plans of the pur-



chasers are said to contemplate a revival of the Flanders electric car as previously produced, but it will be known as the Tiffany Mignon, the firm name also being changed to that of the Tiffany Electric Car Company. In addition there will be a larger and more expensive car produced, which will be styled the Tiffany De Luxe.

Among those said to be associated with Mr. Pelletier in the acquisition of the Flanders concern are Dr. James B. Book, who has been associated with him in previous ventures, including the original E-M-F company, and Don C. McCord, who has been prominent in the Flanders company since its inception and who, it is said, will resume his former position of general manager.

The company has remained practically at a standstill since December, 1912, awaiting business readjustments. The plants at Chelsea and Pontiac, Mich., were operated on a small scale until they were purchased by Harris Bros. & Co. It is said that the new enterprise will not interfere with Mr. Pelletier's connection with the Maxwell Motor Company.

#### ESTABLISHES SERVICE BRANCHES.

#### Apple Electric Company Places Aplco Device Within Reach of All Users.

The Apple Electric Company, Dayton, O., maker of electric motor starters for motor cars and motor boats, as well as electric lighting equipment, announces it has completed arrangements whereby service and installation stations for Aplco devices will be opened immediately in the principal cities. In view of the fact that it has been a problem among manufacturers of electrical equipment to provide users adequate installation and subsequent care service, this announcement marks a signal advance step in the campaign of the Apple company to secure the reward for its efforts in the electrical field.

This arrangement gives to the purchasers of Aplco motor starters and electric lighting systems the benefit of the most thoroughly trained and experienced organizations and insures prompt and efficient attention, not only on the installation of new work, but upon the care of that already installed. The various branches will also carry stocks of Aplco devices and will act as distributing stations for these products, both retail and wholesale, except that the negotiations between the Apple company and automobile manufacturers will be conducted through special representatives from the factory.

Stations are already located in each of the following cities: Newark, N. J.; New York City, Philadelphia, Penn.; Boston, Mass.; Atlanta, Ga.; Chicago, Kansas City, Mo.; Los Angeles, Cal.; Seattle, Wash.; San Francisco, Cal.; London, England; Buenos Aires, Argentine. Others will be established in the near future.

#### WINS DESERVED PROMOTION.

#### George H. Kelly to Direct Sales of All Classes of Baker Electrics.

At a recent directors' meeting of the Baker Motor Vehicle Company, Cleveland, O., maker of Baker electric pleasure and commercial vehicles, George H. Kelly, formerly manager of the truck department of the concern, was advanced to the office of secretary and sales director. R. C. Norton, heretofore secretary and treasurer, will continue as treasurer. E. J. Bartlett becomes sales manager of the truck department and O. B. Henderson continues as sales manager of the pleasure car department.

The election of Mr. Kelly follows his success in developing the truck sales of the Baker company. Established scarcely two years ago, this department has the enviable record of placing machines not only in each section of the United States, but in cities in Europe, Africa, Japan, South America and Alaska. In giving Mr. Kelly the additional office of sales director it has been the purpose of the Baker company to correlate the sales policies of its pleasure car and transport departments under one managing head, so that in their co-operative work with dealers the two divisions may be brought closer together and go forward on a mutually strengthened basis. His many friends throughout the industry will see in this a satisfactory recognition of his merit.



George H. Kelly, Secretary, Baker Motor Vehicle Company.



# NEW AND NOVEL ACCESSORIES THAT APPEAL TO MOTORISTS

## Electrene Fire Gun.

The Western Electric Company, 17 Battery Place, New York City, and with branches in numerous cities, is manufacturing the Electrene fire gun, a fire extinguishing device which is constructed in three styles. That designed especially for service with the motor car, garage, motor boat, etc., is the lightest and of one quart capacity. Lightness and ease of operation are emphasized with the Electrene, and to use it the nozzle is turned and the stream directed at the base of the blaze. It is stated that the stream can be directed accurately by one hand, and that one person can operate two extinguishers at once. The fluid is forced out in a fine spray by compressed air and it is maintained that its efficiency is not impaired by age, heat or cold, and that it will not conduct electricity. Although the fluid will extinguish burning oils, gasoline, etc., it is claimed that it will not injure the most delicate of fabrics nor leave any trace of its presence. The container is sturdily constructed, but light. The company also manufactures sizes adapted to shops, etc.

## Newcomb Carburetor.

The Newcomb carburetor is manufactured by the Holtzer-Cabot Electric Company, Chicago and Boston, and attracted attention in motoring circles by its performance in the recent fuel economy test of a Franklin car when the machine travelled 83.5 miles to a gallon of gasoline. The Newcomb is of the float feed type, having a metering mechanism, which measures the quantities of fuel and air in service. The carburetor operates on a constant vacuum and automatically enlarges the effective air and fuel openings in proportion to each other and to the demand of the motor. The metering mechanism is located in the vaporizing chamber, comprising a hollow plunger surrounding a pipe at the top of which the fuel nozzle is located. A fuel controlling needle is fixed to the upper part of the plunger, near the bottom edge of which are a number of small holes, these distributing the fuel after it has issued from the main fuel measuring orifice. These holes are arranged to register with an equal number of narrow air slots cut in the plunger tube chamber. The plunger is seated on a regulating collar, the function of which is to withdraw the fuel needle from its closed position by raising the plunger without uncovering the air slots. Normally, the fuel nozzle is nearly closed, thus the opening of the fuel port is given a lead with respect to the air ports, slightly enriching the mixture for slow operation. When air is drawn through the carburetor the plunger lifts in proportion and the needle in the nozzle raises at the same time, supplying the fuel required to provide a correct mixture. The higher the plunger is lifted the larger the air and fuel openings. The effective areas of the air and

fuel ports are so proportioned that it is held that the mixture is correct for every air flow. A homogeneous and dry mixture is claimed for the Newcomb, one making for economy of fuel and the elimination of deposits in the cylinder or smoke in the exhaust. A starting device is incorporated. The vaporizer is also water jacketed.

## J-M Mobilite Electric Lamp.

The J-M Mobilite electric lamp is marketed by the H. W. Johns-Manville Company, New York City, and comprises a vulcanized rubber socket fitted to a powerful lens and reflector. The bulb utilized is a special tungsten and it is stated that the light is unusually brilliant. The lamps are made in three styles, the No. 1 being designed for mounting in the dash, while the No. 2 is an automobile type and a rear signal, it having the conventional red semaphore and white light for the license plate. The third design is the dash. A complete equipment of these lamps consists of two set-in, one dash and a tail member. The last named has an ingenious key switch, conforming to the laws of all states requiring that the light be controlled from the rear. Bulbs cannot be stolen from the lamps. It is claimed that the lights are inexpensive to operate; that six No. 6 J-M batteries will operate four lights for 80 to 120 hours, while six No. 8 cells will supply current for 420 hours.

## Herz Bougie Mercedes Spark Plug.

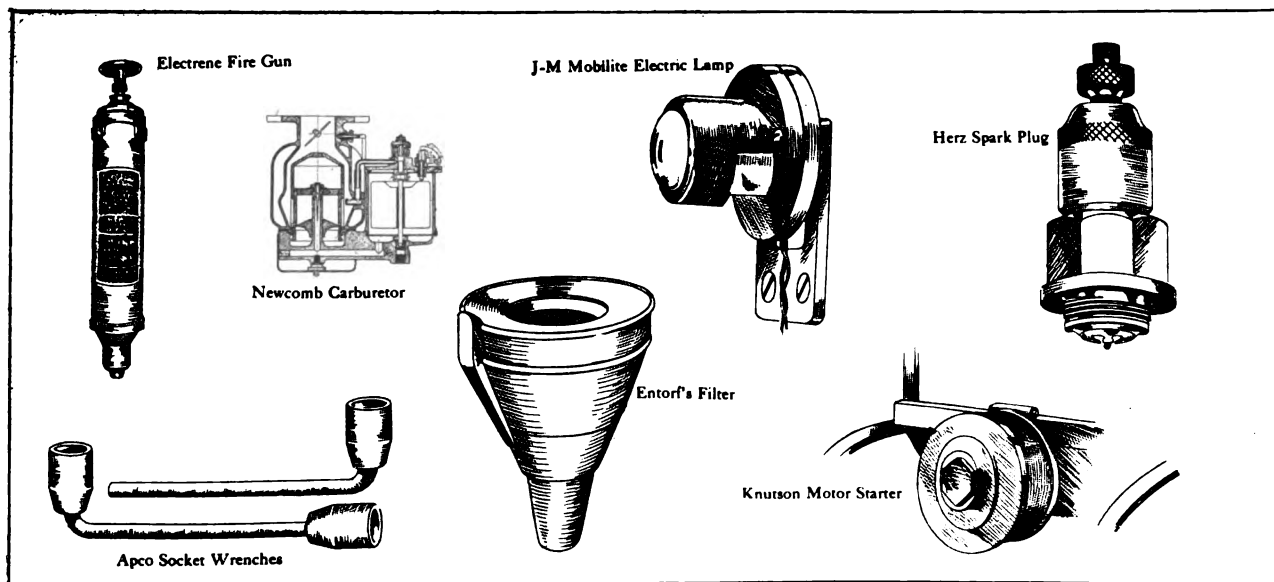
Herz & Co., 295 Lafayette street, New York City, is manufacturing the Herz Bougie Mercedes spark plug, which has as one of its several features a double blue enamel stone, a construction which it is claimed makes it unbreakable and decidedly efficient. The balance of the components are sturdy and the electrodes are constructed of a material which eliminates burning and sooting. The plug is liberally guaranteed. The company also manufactures the Herz magneto.

## Entorf's Water Separating Filter.

Entorf's water separating filter is manufactured by the Entorf Filter Company, Amboy, Ill., and is designed for service with gasoline, kerosene and other similar oils. It resembles a common funnel, but near the top is a fine screen, which retains the oil, thus forming a film and preventing the passage of any water in the fluid. Above the screen is an opening into a drain duct or vent on the outside of the funnel, which the water can enter. Below the first screen is a second member, and another opens into the drain duct. A mechanical device is incorporated at the bottom of the filter, so arranged that the oil will pass through into the spout, while the heavier substance will flow to a reservoir and be discharged outside.

## Apco Ford Socket Wrenches.

The Auto Parts Company, Providence, R. I., manufacturer of Ford accessories, is marketing two types of







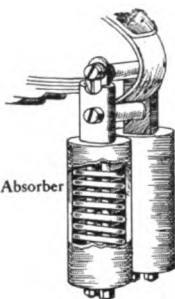
Norisko Lock



Hoyt Pocket Voltmeter



Burn-Boston Battery

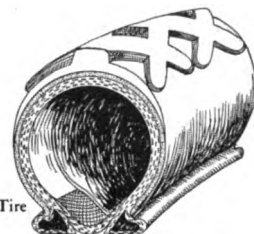
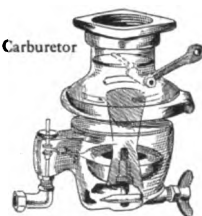


J-M Shock Absorber

Narco Tire Cut Filler



Bowers Carburetor



Mohawk Non-Skid Tire

all steel socket wrenches designed for displacing and replacing the cylinder head bolts of model T Ford motors. As these bolts must be set up snugly to prevent loss of compression, an ordinary tool presents difficulties. The wrench is off-set and it is a simple matter to reach the bolts and to exert considerable leverage through the length of the handle. The socket wrenches are made in two styles, with single and double ends, and the tools may be utilized for a number of purposes. They are moderately priced and guaranteed.

#### Knutson Motor Starter.

The Automatic Devices Company, Galesburg, Ill., is manufacturing the Knutson motor starter, which is of the mechanical type and fitted to the extension of the crankshaft, replacing the usual starting handle. A pressure of the foot on a pedal conveniently located releases a spring, which unwinds slowly at first to prevent sudden stresses. This action is controlled by a brake band and a positive lock. Upon the crankshaft rotating the speed is automatically increased. The spring is re-wound by the rotation of the crankshaft. It is held that the device is mechanically perfect, has few parts, is simple in its operation and that it can be easily attached to any type of gasoline vehicle.

#### Norisko Wheel and Ignition Lock.

The Norisko steering gear and ignition lock is marketed by the C. J. Rogers Manufacturing Company, Abbott building, Philadelphia. It comprises a sturdy shackle permanently secured to the steering post by a unique screw arrangement. It is claimed that the lock cannot be tampered with short of drilling. Within the shackle is a plunger which, when pushed in part way by the thumb, breaks the ignition circuit. A further movement engages the plunger with a slot in the steering post proper, locking the gear after the wheels have been turned at an acute angle. This prevents the car being operated or towed. The Norisko locks automatically and is provided with a Corbin lock and key. The device is nickel plated.

#### Narco Tire Cut Filler.

Narco tire cut filler is the product of the National Rubber Company, St. Louis, Mo., and comes in a compressible tube having a convenient nozzle. The contents of the tube are a special preparation which it is stated will weld itself to the walls of a cut in a casing, becoming integral with the rubber and providing a union so perfect that no road abuse will remove it. The Waite Auto Supply Company, Providence, R. I., is Rhode Island distributor.

#### Burn-Boston Battery.

The Burn-Boston battery, made by the Burn-Boston Battery Company, 19 Doane street, Boston, differs from the conventional dry cell in that a liquid is utilized for an electrolyte. It is square shaped, occupies relatively the same space as a dry cell, and is not affected by heat, cold or moisture. The cell is securely sealed and it is claimed that it will not deteriorate when out of service

for a considerable period. The connections are unusually durable, not being affected by vibration, and the zinc terminal comprises a special wire. The leading features of the Burn-Boston are its long life and efficiency. The voltage is standard.

#### Bowers Carburetor.

The Bowers model G carburetor is marketed by the Gilbert Manufacturing Company, New Haven, Conn., and is simply constructed in that there is but one adjustment to be made, that controlling the fuel. Variable climatic changes are compensated for in the Bowers by the use of an annular brass disc surrounding the central or fixed air inlet, which consists of a venturi shaped tube. The disc contains a plurality of three or more correctly proportioned air ports which admit an additional supply of air and which are controlled progressively to the requirements of the motor by variable tensioned phosphor bronze reeds. These are held to be self-cleaning and not to alter in tension. The adjustment of the Bowers is by a conveniently located needle valve. It is made in standard sizes, is moderately priced, and economy of fuel as well as maximum motor efficiency are emphasized with the construction.

#### Hoyt Pocket Voltmeter.

The storage battery, utilized for lighting or ignition, requires proper care and the cells should be tested from time to time to note their condition. The Hoyt Electrical Instrument Works, Penacook, N. H., maker of current indicating devices, is marketing a voltmeter of the pocket type which is guaranteed to be accurate and which is of the coil type. The new meter, which comes in a sturdy case, averages about 40 ohms a volt, is dead beat in action, slightly larger than a watch and is moderately priced. Being designed particularly for service with storage batteries it forms a valuable addition to the owner's equipment.

#### J. M. Shock Absorber.

The J. M. Shock absorber, marketed by the J. M. Shock Absorber Company, Inc., 210 South 17th street, Philadelphia, is the invention of Jacquet Maurel, a French mechanical engineer, who claims to have solved the problem of applying a helical spring principle to the laminated spring of the motor car. Except on a car having a full elliptic spring, the car spring is attached at its end by a shackle to allow for elongation of the laminated member. In the J. M. this shackle is replaced by its equivalent, a bronze head, which acts as a guide for the helical bolts of the absorber and a bearing for the hanger bolt. Attached to the bronze head is a tube in which is confined the helical spring. This tube allows the spring to be compressed along a true plane at right angles to the car spring, thus obtaining its maximum efficiency. The tubes and springs are of four different diameters, which permit of attachment of the J. M. to any size of machine. The J. M. is designed to increase the efficiency of the regular spring, operate as effectually over smooth as rough



roads, and save the tires and components of the vehicle from vibration and shocks. It is made in single and twin types, for any make of car, also a Ford special, and is guaranteed.

#### Nospill Funnel.

The F. L. Hoaglin Manufacturing Company, Waupaca, Wis., is producing the Nospill funnel, so termed because it eliminates overflowing of the gasoline or liquid used. In addition there is a device which shows the rise of the liquid and means are provided for stopping its passage to the container. When the fuel attains a desired height this is denoted by the central indicator, and further flow is instantly stopped by lifting the funnel ring, which closes a spherical brass valve in the lower portion of the discharge tube. The funnel is of enamelled lead covered steel and polished brass, is of five gallons capacity and a filter is incorporated.

#### Stafford Combination Tail Light.

The Stafford combination tail lamp and illuminated number is produced by the Stafford Manufacturing Company, 1475 Michigan avenue, Chicago, and was designed to meet requirements of various state laws for rear numbers that can be read as well in the night as in daylight. The lamp includes the usual red semaphore, but the illumination of the numbers is by another electric light within the casing, causing the figures and letters to stand out so as to be perfectly legible at a greater distance

starting the machine the rope and pulley arrangement pulls the vehicle as far as the stake.

#### Standard Ford Trunk Rack.

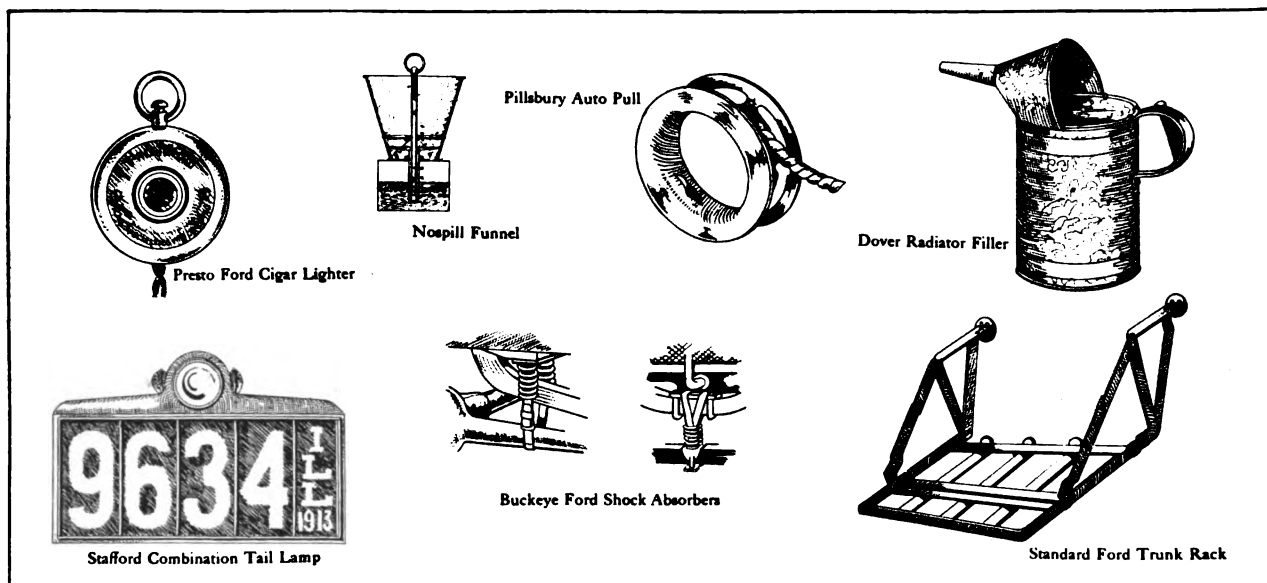
The Connecticut Steel & Wire Company, Hartford, Conn., is manufacturing a high grade trunk rack especially designed for model T Ford cars. It is made of the best .875 by .1875-inch flat steel with hangers one by .25 inch and the finish is black enamel baked on. The rack is secured to the car by means of four sturdy bolts and is braced in such manner as to be sufficiently strong to support any weight in proportion to the size of the car. It is moderately priced.

#### Mohawk Non-Skid Tire.

The Mohawk non-skid tread tire is the product of the Mohawk Rubber Company, Akron, O., and it is claimed that maximum traction is afforded by the suction cups in the centre of the tread, also that the heavy broad ribs take the wear and prevent side slip. It is stated that the best of Sea Island cotton and Para gum are utilized in the construction and that the workmanship is first class in every respect. The New York City branch of the company is at 1864 Broadway.

#### Presto Ford Cigar Lighter.

The Metal Specialties Manufacturing Company, 738 West Monroe street, Chicago, is marketing the Presto Ford cigar lighter, which is designed especially for the model T Ford cars, and current is taken from the mag-



than is required by law. All lamps are fitted with an Edison base socket of the latest type and the device is constructed of the best of material. It is finished in black with nickel listed as slightly extra. The Stafford lamp is moderately priced. The company also manufactures a lamp with a top reflector, having an adjustable bracket and adapted to retain any state license plate.

#### Dover Radiator Filler.

The Dover Stamping & Manufacturing Company, Cambridge, Mass., is producing a handy article for the garage in the nature of a radiator filler. It is a six-quart container and in addition to a serviceable handle, has a hooded spout, which permits of replenishing the supply of the radiator without the usual spilling. It is constructed of heavy galvanized steel and a brass strainer is provided, preventing the entrance of foreign elements into the cooler. The Dover radiator filler is moderately priced.

#### Pillsbury Auto Pull.

The Pillsbury Auto Pull is manufactured by the Pillsbury Sales Company, Minneapolis, Minn., and is a device for fitting over the rear hub cap of the wheel of the motor car to enable extricating the machine from deep sand, etc., which would ordinarily slip the wheels. The device comprises a pulley to which is attached a long rope having a hook at one end. The hook is attached to a stake in the ground, some distance from the car, and upon

neto of the machine. It is constructed to withstand the voltages developed by the flywheel generator, and the electricity heats a platinum wire contained in the lighter, enabling the lighting of a cigar. The device comes with 10 feet of silken cord and can be easily installed by attaching one of the leads to the magneto terminal and the second to metal or ground. By pressing a button in the top of the handle of the lighter, the circuit is closed, heating the platinum. All metal parts of the device are thoroughly insulated and the instrument is not only handy, permitting as it does lighting a cigar in a gale of wind, but it makes for safety. It is moderately priced.

#### Buckeye Ford Shock Absorbers.

The Central Brass & Fixture Company, Springfield, O., announces a new set of shock absorbers designed for Ford automobiles. There are three in a set, one being utilized in the front and two at the rear of the machine. The principle of the Buckeye absorber is the absorption of the recoil of the spring, it being accomplished by a spring coil and strap arrangement. The springs are fully oiled and tempered and the absorber fitted to the front of the chassis is secured by a clip device, easily attached and locked. The rear members are attached as readily. It is claimed that the Buckeye will prevent excessive compression as well as undue recoil of the springs. The set is inexpensive and may be fitted by the most inexperienced.



## NEW YORK'S MOUNTAINS AND LAKES.

### A Visit to the Adirondacks Region by Way of the Catskills and the Thousand Islands, and Return Through the Berkshires and Croton Lake District.

A TOUR that combines much of interest and splendid scenery is that presented herewith as No. 31. It is outlined to occupy six days, starting from and returning to New York City, and while some of the daily mileages are large the tourist undoubtedly will be able to readjust the night stops to accommodate his fancy and the length of time it is desired to remain away from home.

The first day's route runs along the Hudson on the east shore until after passing Poughkeepsie and soon after reaching Kingston turns into the Catskills for the night stop at Highmount. The Catskills are famed throughout the world for their beauty as well as the scene of Washington Irving's tale of Rip Van Winkle, and it is presumed that the tourist will find a single night hardly sufficient to explore their resources.

The Grand Gorge is reached early on the second day, after which the way leads into James Fenimore Cooper's country, turning north through Richfield Springs and Utica. The last named city is pleasantly situated in one of the most beautiful sections of the Mohawk valley and has a number of fine automobile roads. A particularly interesting view is to be obtained from the summit in Roscoe Conklin park. Seven miles west is the Revolutionary battlefield of Oriskany. A little to the east is the splendid Masonic home, which cost more than \$1,000,000.

The way from Rome to Watertown is over a state road with several stretches of macadam in Turin, and thence along the Black river valley. The third night stop is at Alexandria Bay. If possible the tourist should arrange to remain over here at least one whole day, as there is so much of interest to be seen that it cannot well be covered even in a much longer time. A steamer ride among the Thousand Islands in the St. Lawrence river gives some idea of the distinctive beauties of the region, but subsequent trips to other islands will indicate that each has features which are possessed by

none of the others, giving it a charm peculiar to itself.

Ogdensburg is a pretty little city at the confluence of the Oswegatchie and the St. Lawrence, the former of which affords abundant power for various manufacturing establishments. It is known as the Maple City, because of the magnificent maple trees which line its principal streets. Between Ogdensburg and Massena the tourist has opportunity to view the rapids of the St. Lawrence. The Gallops are a little less turbulent than the Rapids du Plats, but are almost as interesting. At the latter the dark

the distant ones being veiled in an exquisite violet hue. Rivers winding in and out among the green forests look like ribbons of silver, while amidst it all lies the peaceful Lake Placid, and separated from it by only a wooded eminence is Mirror lake.

Rich lake views, with occasional glimpses of Lake Champlain, are to be found on the way to Elizabethtown. Below Port Henry, at Crown Point, are the ruins of the old French Fort Frederick, the ramparts of which are brilliant with red thorn apples, in their season, a tree which is found nowhere else in the state and which



In the Midst of the Beautiful Lake Country of the Adirondacks.

swirling waters make a beautiful sight as they dash and tumble over each other in their haste.

From Malone to Lake Placid the tour traverses the Adirondacks region, with plenty of temptation to tarry. Lake Placid is perhaps the best known of all the Adirondack resorts, and is surrounded by high mountains. At the northern end the scenery becomes bold and imposing. Hoary old Mt. Whiteface raises its head 4780 feet high above the rest, cleaving the clouds in its solitary grandeur. All of the Adirondacks' gaunt peaks are in sight,

is said to have been brought here from France. An interesting drive along the lake from Ticonderoga brings the tourist to the ruins of Fort Ticonderoga, crowning a high hill near the steamboat landing.

The way then leads into Vermont, but only for a little time, then back and forth across the line, through country that is rich with inspiring views and over roads that are exceptionally good, until Hoosick Falls is reached. Near this town is the battlefield of Walloomsac, where occurred the conflict which has gone down in





At Left, View in the Vicinity of Richfield Springs; at Right, Island Dotted Lake in Catskill Foothills.

history as the battle of Bennington, fought on New York soil instead of in Vermont.

The last night stop is at Pittsfield, Mass., the Heart of the Berkshires. The way then leads through Lenox and Stockbridge, well known for the singular purity of their air. Many summer homes of wealthy people are located in this immediate vicinity and lend their beauty to nature.

The northwest corner of Connecticut is crossed before passing into the Empire state.

One of the distinctive features in the vicinity of Dover Plains is Chestnut ridge, which extends north and south for about three miles and forms a part of the water shed between the Hudson and Housatonic rivers. The small streams from the western hills

have worn deep ravines and in several places have formed beautiful cascades. A few miles from the village, one of these streams flows down the mountains in a succession of rapids, and at the foot of each fall smooth rounded holes, called wells, have been worn in the rocks to a considerable depth. Near this, and a little higher up in the mountains, is a stream which has worn a remarkable channel in the rocks, forming a cavern with a gigantic Gothic arch, known locally as "the old stone church".

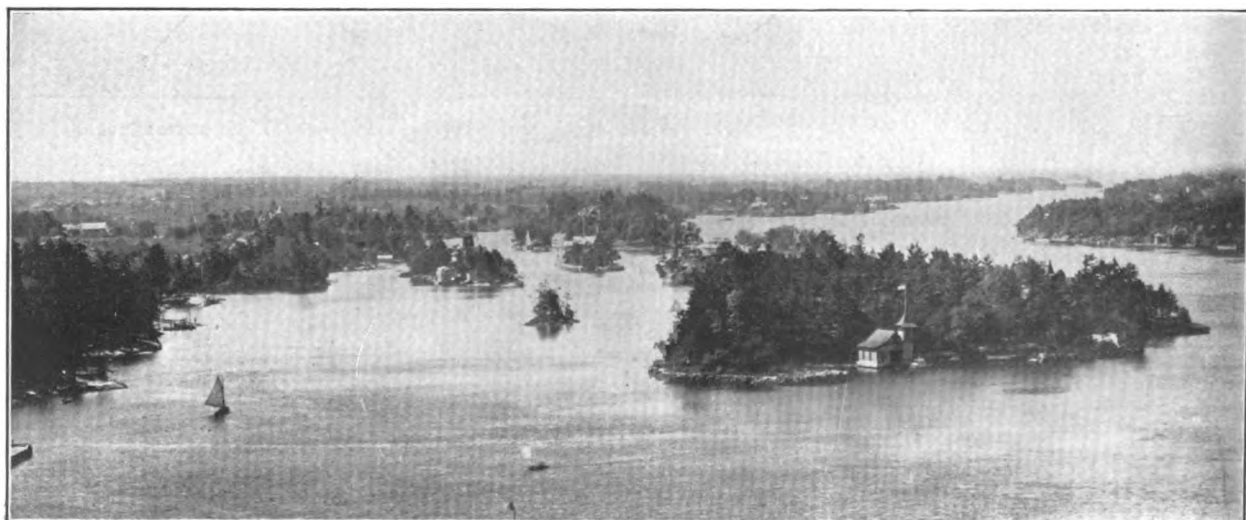
#### ITINERARY NO. 31.

Night Stops—New York, Highmount, Utica, Alexandria Bay and Lake Placid, N.

Y.; Pittsfield, Mass. Six Days, 908.4 Miles.

New York-Highmount, 146.4 Miles.

|                        | Miles to | Total Miles |
|------------------------|----------|-------------|
|                        | Out      | Return      |
| New York .....         | 0.0      | 0.0         |
| Yonkers .....          | 13.2     | 13.2        |
| Irvington .....        | 7.8      | 21.0        |
| Tarrytown .....        | 2.7      | 23.7        |
| Ossining .....         | 6.2      | 29.9        |
| Croton .....           | 3.8      | 33.7        |
| Peekskill .....        | 7.5      | 41.2        |
| Cold Spring .....      | 11.3     | 52.5        |
| Fishkill Landing ..... | 7.8      | 60.3        |
| Hughsonville .....     | 6.2      | 66.5        |
| Wappinger Falls .....  | 1.4      | 67.9        |
| Poughkeepsie .....     | 7.4      | 75.3        |
| Highland .....         | 2.6      | 77.9        |
| Esopus .....           | 7.9      | 85.8        |
| Ulster Park .....      | 2.4      | 88.2        |
| Port Ewen .....        | 3.5      | 91.7        |
| Kingston .....         | 4.0      | 95.7        |
| Glenerie .....         | 6.8      | 102.5       |
| Glenerie Falls .....   | 1.7      | 104.2       |



The Thousand Islands, from Alexandria Bay, One of the Prettiest Playgrounds in Northern New York.



|                    |     |       |      |
|--------------------|-----|-------|------|
| Saugerties .....   | 2.8 | 107.0 | 39.4 |
| Unionville .....   | 4.3 | 111.3 | 35.1 |
| Woodstock .....    | 7.0 | 118.3 | 28.1 |
| Bearsville .....   | 1.8 | 120.1 | 26.3 |
| Lake Hill .....    | 3.0 | 123.1 | 23.3 |
| Willow .....       | 2.5 | 125.6 | 20.8 |
| Mt. Pleasant ..... | 4.2 | 129.8 | 16.6 |
| Phoenicia .....    | 3.7 | 133.5 | 12.9 |
| Allaben .....      | 4.3 | 137.8 | 8.6  |
| Shandaken .....    | 1.5 | 139.3 | 7.1  |
| Pine Hill .....    | 5.6 | 144.9 | 1.5  |
| Highmount .....    | 1.5 | 146.4 | 0.0  |

Highmount-Utica, 126.9 Miles.

|                               | Miles to | Total Miles |       |
|-------------------------------|----------|-------------|-------|
|                               | Out      | Out Return  |       |
| Highmount .....               | 0.0      | 0.0         | 126.9 |
| Griffins .....                | 2.0      | 2.0         | 124.9 |
| Fleishmanns .....             | 1.5      | 3.5         | 123.4 |
| Arkville .....                | 3.5      | 7.0         | 119.9 |
| Kelly's Corners .....         | 2.7      | 9.7         | 117.2 |
| Halcottville .....            | 2.0      | 11.7        | 115.2 |
| Roxbury .....                 | 6.5      | 18.2        | 108.7 |
| Grand Gorge .....             | 7.3      | 25.5        | 101.4 |
| Stamford .....                | 7.5      | 33.0        | 93.9  |
| Harpersfield .....            | 6.0      | 39.0        | 87.9  |
| Davenport .....               | 8.0      | 47.0        | 79.9  |
| Davenport Center .....        | 1.8      | 48.8        | 78.1  |
| West Davenport .....          | 5.0      | 53.8        | 73.1  |
| Colliers .....                | 6.8      | 60.6        | 66.3  |
| Milford Center .....          | 2.4      | 63.0        | 63.9  |
| Portlandville .....           | 1.3      | 64.3        | 62.6  |
| Milford .....                 | 4.4      | 68.7        | 58.2  |
| Cooperstown .....             | 8.5      | 77.2        | 49.7  |
| Springfield Cen-<br>ter ..... | 10.3     | 87.5        | 39.4  |
| Warren .....                  | 3.5      | 91.0        | 35.9  |
| Richfield Springs .....       | 3.1      | 94.1        | 32.8  |
| East Winfield .....           | 9.1      | 103.2       | 23.7  |
| West Winfield .....           | 2.2      | 105.4       | 21.5  |
| Bridgewater .....             | 3.5      | 108.9       | 18.0  |
| N. Bridgewater .....          | 3.4      | 112.3       | 14.6  |
| Cassville .....               | 1.6      | 113.9       | 13.0  |
| Clayville .....               | 2.8      | 116.7       | 10.2  |
| Sauquoit .....                | 2.0      | 118.7       | 8.2   |
| Washington Mills .....        | 3.5      | 122.2       | 4.7   |
| Utica .....                   | 4.7      | 126.9       | 0.0   |

Utica-Alexandria Bay, 128.3 Miles.

|                      | Miles to | Total Miles |       |
|----------------------|----------|-------------|-------|
|                      | Out      | Out Return  |       |
| Utica .....          | 0.0      | 0.0         | 128.3 |
| Deerfield .....      | 1.4      | 1.4         | 126.9 |
| Rome .....           | 14.9     | 16.3        | 112.0 |
| Delta .....          | 5.9      | 22.2        | 106.1 |
| Stokes .....         | 1.7      | 23.9        | 104.4 |
| West Branch .....    | 4.7      | 28.6        | 99.7  |
| Ava .....            | 3.5      | 32.1        | 96.2  |
| West Leyden .....    | 2.8      | 34.9        | 93.4  |
| Mohawk Hill .....    | 4.7      | 39.6        | 88.7  |
| Constableville ..... | 4.0      | 43.6        | 84.7  |
| Turin .....          | 4.8      | 48.4        | 79.9  |
| Houseville .....     | 4.0      | 52.4        | 75.9  |
| Martinsburg .....    | 4.2      | 56.6        | 71.7  |
| Lowville .....       | 3.6      | 60.2        | 68.1  |
| Denmark .....        | 9.1      | 69.3        | 59.0  |
| Carthage .....       | 6.1      | 75.4        | 52.9  |
| Heaving .....        | 4.2      | 79.6        | 48.7  |
| Fells Mills .....    | 4.7      | 84.3        | 44.0  |
| Black River .....    | 3.2      | 87.5        | 40.8  |
| Watertown .....      | 6.6      | 94.1        | 34.2  |
| Brownville .....     | 4.2      | 98.3        | 30.0  |
| Depauville .....     | 11.2     | 109.5       | 18.8  |
| Clayton Center ..... | 4.1      | 113.6       | 14.7  |
| Clayton .....        | 3.7      | 117.3       | 11.0  |
| Alexandria Bay ..... | 11.0     | 128.3       | 0.0   |

Alexandria Bay-Lake Placid, 172.7 Miles.

|                      | Miles to | Total Miles |       |
|----------------------|----------|-------------|-------|
|                      | Out      | Out Return  |       |
| Alexandria Bay ..... | 0.0      | 0.0         | 172.7 |
| Redmond .....        | 6.7      | 6.7         | 166.0 |
| Hammond .....        | 11.9     | 18.6        | 154.1 |
| Brier Hill .....     | 6.0      | 24.6        | 148.1 |
| Morristown .....     | 4.0      | 28.6        | 144.1 |

|                       |      |       |       |
|-----------------------|------|-------|-------|
| Ogdensburg .....      | 10.8 | 39.4  | 133.3 |
| Waddington .....      | 19.9 | 59.3  | 113.4 |
| Massena .....         | 17.0 | 76.3  | 96.4  |
| Raquette River .....  | 6.4  | 82.7  | 90.0  |
| Hogansburg .....      | 7.0  | 89.7  | 83.0  |
| Fort Covington .....  | 8.9  | 98.6  | 74.1  |
| Westcott Center ..... | 6.2  | 104.8 | 67.9  |
| Malone .....          | 10.0 | 114.8 | 57.9  |
| Whippleville .....    | 2.4  | 117.2 | 55.5  |
| Studley Hill .....    | 5.5  | 122.7 | 50.0  |
| Duane Center .....    | 9.2  | 131.9 | 40.8  |
| Gabriel Station ..... | 22.2 | 154.1 | 18.6  |
| Saranac Lake .....    | 8.8  | 162.9 | 9.8   |
| Lake Placid .....     | 9.8  | 172.7 | 0.0   |

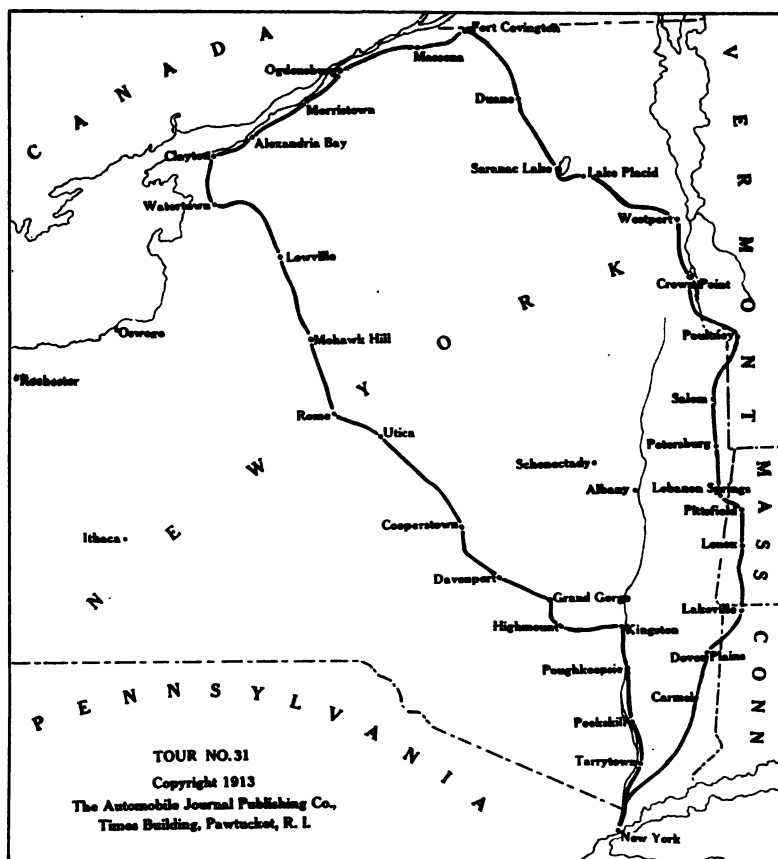
Lake Placid-Pittsfield, 187.7 Miles.

|                   | Miles to | Total Miles |       |
|-------------------|----------|-------------|-------|
|                   | Out      | Out Return  |       |
| Lake Placid ..... | 0.0      | 0.0         | 187.7 |

|                               |      |       |      |
|-------------------------------|------|-------|------|
| Cambridge .....               | 11.4 | 133.0 | 54.7 |
| North Hoosick .....           | 8.0  | 141.0 | 46.7 |
| Hoosick Falls .....           | 2.4  | 143.4 | 44.3 |
| North Petersburg .....        | 6.6  | 150.0 | 37.7 |
| Petersburg .....              | 5.5  | 155.5 | 32.2 |
| Berlin .....                  | 4.8  | 160.3 | 27.4 |
| South Berlin .....            | 4.4  | 164.7 | 23.0 |
| Stephentown .....             | 7.0  | 171.7 | 16.0 |
| Lebanon Springs .....         | 5.5  | 177.2 | 10.5 |
| Shaker Village,<br>Mass. .... | 5.8  | 183.0 | 4.7  |
| Pittsfield .....              | 4.7  | 187.7 | 0.0  |

Pittsfield-New York, 146.4 Miles.

|                  | Miles to | Total Miles |       |
|------------------|----------|-------------|-------|
|                  | Out      | Out Return  |       |
| Pittsfield ..... | 0.0      | 0.0         | 146.4 |
| Lenox .....      | 6.5      | 6.5         | 139.9 |



|                                  |      |       |       |
|----------------------------------|------|-------|-------|
| Cascade Lake .....               | 10.5 | 10.5  | 177.2 |
| Keene .....                      | 4.7  | 15.2  | 172.5 |
| Elizabethtown .....              | 12.4 | 27.6  | 160.1 |
| Westport .....                   | 8.6  | 36.2  | 151.5 |
| Port Henry .....                 | 10.3 | 46.5  | 141.2 |
| Crown Point .....                | 7.4  | 53.9  | 133.8 |
| Ticonderoga .....                | 8.7  | 62.6  | 125.1 |
| Addison Jct. ....                | 2.0  | 64.6  | 123.1 |
| Ticonderoga Fer-<br>ry, Vt. .... | 0.2  | 64.8  | 122.9 |
| Orwell .....                     | 6.1  | 70.9  | 116.8 |
| Benson .....                     | 7.2  | 78.1  | 109.6 |
| Fair Haven .....                 | 8.3  | 86.4  | 101.3 |
| Poultney .....                   | 5.7  | 92.1  | 95.6  |
| Middle Granville,<br>N. Y. ....  | 6.7  | 98.8  | 88.9  |
| Granville .....                  | 2.1  | 100.9 | 86.8  |
| West Pawlet, Vt. ....            | 5.0  | 105.9 | 81.8  |
| Rupert .....                     | 7.5  | 113.4 | 74.3  |
| West Rupert .....                | 1.5  | 114.9 | 72.8  |
| Salem, N. Y. ....                | 6.7  | 121.6 | 66.1  |
| Stockbridge .....                | 6.0  | 12.5  | 133.9 |
| Great Barrington .....           | 7.5  | 20.0  | 126.4 |
| South Egremont .....             | 4.0  | 24.0  | 122.4 |
| Lakeville, Conn. ....            | 14.9 | 38.9  | 107.5 |
| Sharon .....                     | 7.1  | 46.0  | 100.4 |
| Dover Plains,<br>N. Y. ....      | 13.0 | 59.0  | 87.4  |
| South Dover .....                | 7.8  | 66.8  | 79.6  |
| Hurds Corners .....              | 4.4  | 71.2  | 75.2  |
| Pawling .....                    | 2.3  | 73.5  | 72.9  |
| Carmel .....                     | 13.4 | 86.9  | 59.5  |
| Lake Mahopac .....               | 5.5  | 92.4  | 54.0  |
| Baldwin Place .....              | 3.8  | 96.2  | 50.2  |
| Amawalk .....                    | 5.1  | 101.3 | 45.1  |
| Yorktown Heights .....           | 1.6  | 102.9 | 43.5  |
| Briarcliff Manor .....           | 11.2 | 114.1 | 32.3  |
| Elmsford .....                   | 8.5  | 122.6 | 23.8  |
| Hart's Corners .....             | 3.0  | 125.6 | 20.8  |
| Greenville .....                 | 1.5  | 127.1 | 19.3  |
| Central Bridge .....             | 14.1 | 141.2 | 5.2   |
| New York .....                   | 5.2  | 146.4 | 0.0   |



## MECHANICAL NOTES FOR OWNERS.

### Outlining a Simple Method of Repairing a Broken Frame--Proper Adjustment of Fan Belts--Making an Emergency Tail Light.

**M**ANY times the motorist is confronted with minor troubles while on the road and occasionally a serious break occurs that taxes his ingenuity. The latter condition is more applicable to an old machine, as the manufacturer of the modern car has eliminated those faults which formerly gave trouble. The accompanying contribution, with an illustration, from a reader, is of interest in that it demonstrates that one can successfully surmount obstacles, as well as save considerable expense that would otherwise be involved. In the instance referred to, the reader made a repair to a broken frame and goose neck, and completed his journey of some 50 miles. As explained by him, the temporary repair was by no means difficult and the expenditure of but 15 cents saved him many dollars, to say nothing of

ble courtesy and that the stock cost but 15 cents. Of course there was considerable hard work, but I figure I saved several dollars, besides being able to get the car back home.

#### MAKING A TIRE PROTECTOR.

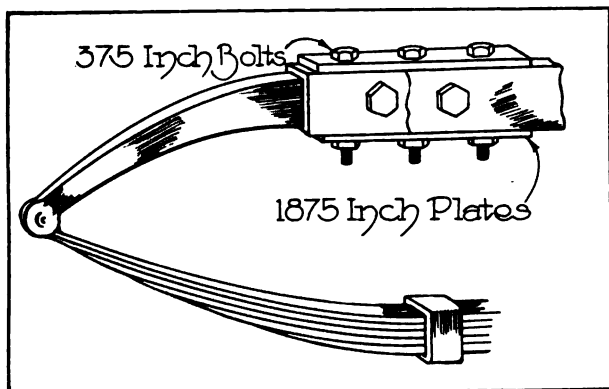
If one is so unfortunate as to be caught with a small blow-out and without an inside or outside patch, these can be made with some cloth and friction tape. Take a piece of cloth several times larger than the opening in the shoe and on one side lay strips of tape, much in the same manner as a surgeon plasters a cut. Next fold the cloth with the tape inside and lay a few strips of tape on the side that goes next to the inside of the casing. In replacing the inner tube be careful that the patch does not slip. If the shoe is cleaned carefully the tape will adhere. Partially inflate the shoe. Prepare another patch slightly larger than the opening in the tire, but tape both sides. Press the patch firmly against the blow-out and then wind tape around the shoe and felloe, taking care to have each wrap very snug. Inflate in the usual manner. This repair if properly executed will endure for some time and will at least serve to get one home.

#### FITTING NEW PISTON RINGS.

In fitting new piston rings to an old cylinder, the walls of which are smooth, it is an excellent plan to stone the rings before placing them on the piston, if they are simply of the machined type. It is an easy matter to create a glass like surface by polishing the periphery of the ring on an oil stone, using plenty of lubricant. A slight pressure should be exerted and the ring turned from time to time to insure a smooth, even surface.

#### FAN BELT TENSION.

The fan should be given attention as it aids in keeping the motor cool. The tension of the belt is important, and care should be exercised in adjusting it so as not to have it too loose or too tight. With the majority of cars provision is made for taking up any stretch of the belt. Some employ an eccentric as with the Overland, shown in an accompanying illustration.



Showing How a Broken Frame Was Repaired, Enabling Owner to Complete His Journey.

the immediate use of his machine when needed. His letter follows:

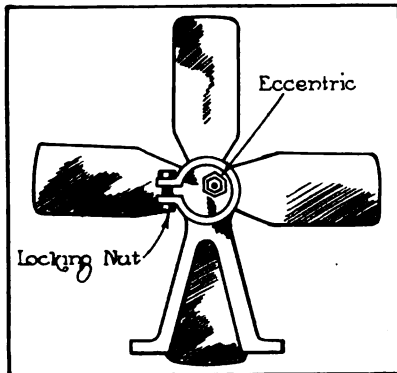
Noting several contributions to your notes for owners, I am enclosing a rough sketch of a repair I made to my car. I was unfortunate in having the frame break at the point shown in the drawing, and this took place some distance from a garage. The frame settled almost to the axle, but by jacking up the former, I was able to place a block of wood under it, and by driving slowly made the nearest garage.

I was advised by the proprietor, who called in his head repairman, to leave the machine or else attempt the return trip with the frame blocked up. As the roads were very rough I did not deem the latter suggestion advisable. After a little study I evolved the plan shown in the drawing. I took two plates .1875 inch thick and cut these to fit the top and lower parts of the frame as shown in the sketch. Next I jacked up the frame and bent it back into shape, after which I drove out the rivets holding the goose neck.

The plates were then drilled to take .375-inch bolts, clamped over the frame and locked. The car was then tried out, and the nuts again tightened. The repair held, although the roads traversed were very rough. I might add that the owner of the garage extended every possi-



To increase the tension of the belt the locking nut is loosened, also the bolt member, and the eccentric partially rotated. It should be borne in



Fan Adjustment on Overland Cars.

mind that a belt that is too tight will subject the fan bearings to undesirable stresses. It is also a good plan to renew the supply of lubricant in the grease cup and to turn this member down occasionally.

Belts that have become saturated with grease may be cleaned easily with gasoline. Inspect the bearings from time to time as with the fan near the radiator undue play might result in the blades cutting a hole in the cooler.

### LOCATING LEAKS.

Small leaks in the fuel system of the pressure type, in inner tubes, exhaust manifold, valve caps, spark plugs, etc., are not always located easily. A tiny puncture of an inner tube is troublesome and the usual method is to immerse the tube in a tank of water and watch for the arising bubbles of air. A simpler plan is to make a solution of soap and water and smear the tread. The smallest of leaks will be noted easily by large bubbles. An oil can filled with the same mixture is handy for testing the fit of the valve caps, spark plugs, etc., and has an advantage over the oil method in that it is cleaner to handle.

### CLEANING MAGNETO.

While the magneto does not require attention other than an occasional oiling and in accordance with the instructions of the maker, it is a good plan to remove the breaker box and distributor covers and clean the components of these members. A small, soft brush will be of service, as with it all foreign elements may be displaced easily. This should be done at stated intervals, especially if the magneto is exposed to dust, etc.

### FITTING BLOW-OUT SLEEVES.

Many motorists make it a practise to carry a blow-out patch and a tire sleeve. When the lat-

ter is of the lace-on type, the shoe should be only partially inflated and the lacing drawn up snugly, after which the pumping of the tire will tend to keep the sleeve in place. If the blow-out is near the bead, several layers of canvas placed over the hole and a patch on the inside will enable one to reach home, as the canvas forms a compress.

### CUP GREASE MIXTURE.

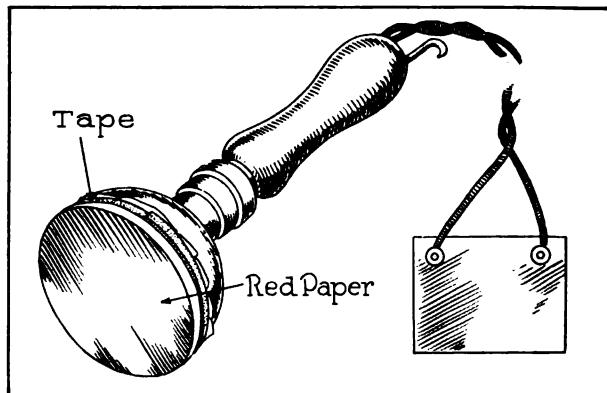
The practise of the manufacturer to provide grease cups for parts subject to friction is becoming more general. While makers of lubricants produce grease especially adapted for the parts, an excellent compound may be made by mixing a small quantity of powdered graphite with the grease.

### AN EMERGENCY TAIL LIGHT.

In some cities the ordinance respecting the tail light is strictly enforced. With either the kerosene or electric units it is possible that they may be injured through accident so that a new one is required. This means leaving the car or risking arrest. The manner in which a reader improvised a tail light from a trouble lamp demonstrates how easily troubles may be overcome. The temporary lamp and the manner in which it was constructed is depicted in an accompanying illustration.

Am enclosing a sketch showing how I made a tail light from a trouble lamp, and the suggestion may be of value to some of your readers, especially if they motor where the officers are very strict about the law regarding the rear light. My tail light uses kerosene, and was so badly damaged by another car backing into it, that it looked as if I would have to leave the machine until I could get a new lamp.

Not caring to leave the car or take a chance of being



Ingenious Method of Converting Trouble Lamp into a Tail Light by Fitting Red Paper Over Lens.

arrested, I solved the problem by taking my electric trouble lamp and covering the lens with some red paper. The latter I secured at a nearby store. By using friction tape it was an easy matter to hold the paper in position.

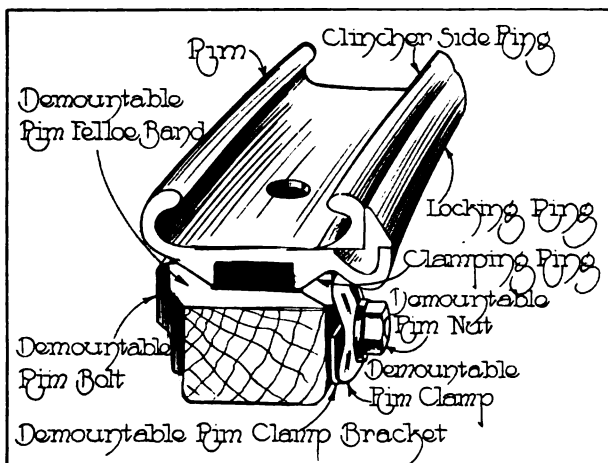


I then lashed the lamp to the tail light bracket and connected the battery. The result was a very good red light. There was no white light on my license plate, but I got home safely, although I was stopped by one officer, to whom I explained my predicament, and who allowed me to proceed on my way.

### DEMOUNTABLE RIMS.

The new owner as a rule does not give his tire equipment any consideration until a puncture or a blow-out compels him to make a change. This lack of attention is due largely to the fact that demountable rims are fitted and that an extra casing is carried on a spare rim. Invariably in attempting to replace a punctured tube with a new one, trouble will be experienced if one is not familiar with the components of the rim.

In an accompanying illustration is shown a sectional view of the Firestone quick detachable, quick demountable rim; a construction with which the tire may be taken off easily with the



Components of Firestone Quick Detachable, Quick Demountable Rims.

rim on the felloe, or both removed as a unit. The components are lettered and a little study should enable one to grasp the principles involved.

To remove the demountable rim and tire, the wheel is jacked up and the brace wrench employed to loosen the rim nuts. Next slide each rim clamp as far as it will go to permit removal of the clamping ring, which retains the rim proper. Lock the nuts by the fingers, else they will slide back into their original position when the rim is being removed. Turn the wheel so that the valve is at the top, then swing out the lower side of the rim and lift it with its tire off the wheel. The valve hole in the felloe is tapered to permit easy operation, as well as to prevent injury to the valve stem.

It is not necessary to displace the dust cap in the work. It should always be kept screwed up

tightly against the valve sleeve, except when detaching the casing from the rim. No lock or milled nut is necessary with the valve stem. The valve sleeve, in connection with the dust cap, holds down the spreader and prevents entrance of water through the valve hole in the rim base.

To mount a spare rim with its inflated tire: Take the clamping ring which has been removed and place it in the same position; that is, with the point of the wedge toward the inside as shown in the drawing. Next turn the wheel so that the valve hole in the felloe is at the top, insert the valve stem through the hole and swing the lower part of the rim into place. The rim nuts are then loosened and slid into the position shown in the drawing and locked by the brace wrench. After locking each member, go over them a second time to make sure they are snug.

To detach a shoe from rim without removing latter: The wheel is jacked up, the dust cap removed and the plunger of the valve depressed to allow any existing air in the tube to escape. Next push the valve stem up as far as it will go, thereby releasing the spreader inside the casing and making easy the work of dismounting the detachable mechanism. Push the clincher side ring in as far as it will go and until it is entirely disengaged. Insert any convenient object between these two rings, near the end, of sufficient size to permit of the locking rim clearing the side member. By inserting a screw driver in the slot at the end of the locking rim, and by prying, the rim should be moved out of its groove. By passing the blade of the tool under the ring it may be sprung out easily. The clincher side ring may now be removed. The tire is displaced by moving it outward, commencing opposite the valve, then lifting it out at this point so as to prevent injuring the valve stem and tube.

Before fitting a new tube, clean the interior of the casing and use plenty of soapstone. In replacing the tube in the shoe be careful not to have any twists or wrinkles. The shoe is next replaced, then the side ring and the locking ring. The last named is applied by engaging the pin in the notch in the edge of the rim and by forcing the locking ring into its groove around the wheel. After inflating the tire to the pressure recommended by the maker, replace dust cap, screwing it snugly against the valve sleeve. The maker of the Firestone rims advises that the valve sleeve supplied with every set of quick detachable, demountable rims, be used, as it prevents the side ring from becoming disengaged from the split ends of the locking ring. It also serves to prevent moisture from reaching the tire around the valve stem.



## WITH THE MOTORING INTERESTS ABROAD.

### Results of the Recent Third International Road Congress in London, England— More About Geneva Conference on American Invasion—Foreign Notes.

MUCH time was devoted to subjects intimately connected with the use of motor vehicles at the third international road congress, which convened recently in London, England. The keynote may be said to have been sounded by Lloyd George of England in his speech of welcome, in which he referred to the revolution which has come about in the use of roads through the development of motor traffic. He did not think this a matter to be deplored, for the more communication was improved the less was spent on distribution, and the more was available for production. Bad roads, he declared, meant a horse taken away from the plow and attached to a cart.

Accredited delegates were present from 39 governments, representing practically every civilized country in the world. And as usual with such gatherings, much of the business was transacted in sections and by sub-committees.

The first section was devoted largely to the consideration of reports from nations concerning the planning of new roads and streets, and resolutions embodying the suggestions, were adopted. Chief among these were that new main roads should be constructed to pass outside rather than through cities and towns, and that the planning of main road communication outside towns should be undertaken at once, the initiative to rest with a central state authority. The subject of road surfacing also was taken up and certain recommendations covering wood block paving, and asphalt for bridges and easy gradients, were adopted.

The second section took up the matter of road lighting. It was decided that it was quite clear that as country villages and urban districts could not light the roads in a way adequate for modern traffic, therefore the user must carry his light with him. Thus it will be seen that the international road congress has placed its seal of approval on the subject of universal lighting, so-called. It also was decided that motor lights should be proportionate to the speed and should enable the driver to see an obstruction at least twice as far off as the distance in which his brakes could pull him up. Resolutions were adopted that in inhabited places the headlight should be limited to the illuminating power of an ordinary lamp,

and that one color should be adopted as a danger signal.

The third section took up the question of highway administration. The reports from the different nations showed a greater tendency toward larger centralization. It was decided that the task of constructing roads should be placed in the hands of larger units than the local authority. A Belgian delegate advocated the state control of all roads, but the conclusion reached was that it was difficult to make one rule which would apply to all countries.

The business of the congress naturally covered a wide range, and it would prove impractical to review the entire proceedings here, were it possible to condense all the various reports and papers presented. The general principle of the following conclusions was approved:

1—The expenditure on the maintenance and improvement of (a) the roads which serve as main routes of communication between important places in any country or (b) the roads which are used mainly by long distance traffic, unless such expenditure is borne wholly out of national revenues under a system of state administration of roads (which system is practicable and suitable in the case of some roads in some countries), should be mainly paid out of the national revenues, whether or not such roads are locally administered and maintained, subject, where local administration prevails, to the supervision of a central government authority both as to efficiency and expenditure.

2—It is desirable to abolish, so far as possible, all tolls on public roads, but it is equitable that the owners of vehicles which, on account of their weight or weight combined with speed or any other exceptional circumstances connected with either the vehicle or the use of the road, cause special damage to roads beyond the wear and tear of the ordinary traffic of any district should be subject to special taxation, the proceeds of which should be earmarked for expenditure on roads.

3—Borrowing money for new road construction and for the periodic renewal of the surface coating of a road is consistent with sound financial principles, provided that the loan period in the case of loans for renewals is kept well within the life of the surface coating.

Another important point discussed was that dealing with the construction of macadam ways bound with tarry, bituminous or asphalted materials. This occupied much time and brought out many interesting details. The main decision reached was that it was important, both in the interests of the duration of the road and the comfort of the users, that repairs should be made immediately a defect showed itself. Concerning the main proposition, a Russian delegate suggested that a committee be appointed to investigate the various methods used in different parts of the world and report at the next congress.



In the matter of traffic regulations the following conclusions, as prepared by Lord Montagu of England, editor of *The Car* and an international motorist of note, were adopted after long discussion:

1—That all regulations for the control of road traffic should be based on the principle of allowing the speed practicable for each different kind of vehicle consistent with public safety, general convenience and the normal wear of the roads.

2—That regulations for the conduct of fast and slow traffic should be as few and simple as possible, and should be such as can and ought to be universally adhered to and enforced.

3—That in large cities there should be a traffic authority on whom should be charged the duty of studying and dealing with street traffic problems, the powers of such authority and the co-ordination of such powers with those of other public authorities being matters of detail which must be settled by public authorities on consideration of the circumstances and conditions of each large city.

4—That there should be ample provision of traffic controllers (such as the police in London) with adequate



**Ten-Year-Old Waverley Electric in Service in England.**

powers to regulate the traffic, not only at congested points, but throughout the course of crowded streets.

5—That having regard to the increased danger which is necessarily created by the conditions of modern traffic, it is important that drivers should be carefully and systematically trained, and that children should be especially taught how to provide against the dangers of the road.

6—That except where local circumstances render it absolutely necessary, no obstructions, such as lamp posts, tramway standards, etc., should be placed in the centre of the road, except necessary refuges for pedestrian crossing.

7—No obstruction of the public highway should be permitted either by vehicles standing unreasonably, or by things placed on the highway. Exception must, however, be made for depots required for the work of maintenance or repair of the road, and for work being carried out by duly authorized and competent authorities, but in every case all necessary steps must be taken to insure the safety of traffic.

8—That regulations for roads and traffic must aim at defining the rights, duties and responsibilities for each kind of traffic in order to avoid the causes of accidents and damage, and to insure the maximum of order and liberty.

## TEN-YEAR-OLD WAVERLEY.

### British Owner Finally Decides It Is Time to Secure New Model.

The question often arises as to the life of an automobile. As a matter of fact it is still impossible to give the answer; the automobile industry is much too young, apparently. Many machines have been in service for several years, although it is admitted that most Americans prefer to exchange their cars for newer models after they have had them a few years. The tendency in this respect is not so marked as it was formerly, however.

Nicholas Kilvert, Brooklands, Cheshire, England, managing director of the Lancashire Dynamo & Motor Company, Manchester, has a Waverley electric runabout, made by the Waverley Company, Indianapolis, Ind., which he purchased in 1903. The factory number of the car is 1150. It has been in almost constant use since that time, and it was only within a month that Mr. Kilvert finally decided to part with it, ordering a model 98 Waverley limousine to replace it.

No record of its mileage has been kept. The owner says that the expenses have been very trifling, the renewal of batteries and tires being the chief items. The charging power has been obtained from a plant at the owner's residence, and it is his belief that £5 a year would cover this. Fire insurance only has been covered, as other risks have been considered too slight to justify any protection. The machine has been used almost daily, six days a week during the 10 years, for station work and social purposes, on country roads in Cheshire, being driven almost exclusively by the owner's daughters.

## GENEVA CONFERENCE.

### French Makers Were Not Represented and Do Not Fear American Invasion.

The Geneva conference, which recently entered a protest against the American automobile invasion, was not so international and not so precise in its objects as appeared, according to a later report received from Paris, France. Also, it was not representative, as none of the French firms was aware the congress was to be held and none sent delegates.

Louis Renault, who presided, was not the automobile manufacturer of that name, it is stated, but a professor of law. M. Renault, the automobile maker, is at Paris, but has refused to discuss the subject of the congress. Marquis de



Dion said: "I regret that America's charges for tariff are 45 per cent., when we charge 10. If we wanted we could build automobiles of the same class and price as the American, but at present I do not see the necessity."

M. Koechlin of the Peugeot firm said: "I welcome the invasion, as it opens a new market for us, especially abroad. American competition in France is not dangerous. American low priced machines appeal to a certain class of buyers. It is impossible for us to produce such a cheap machine here, as labor conditions are different, but we do not want a cheap market."

M. Weydert of the Darracq company stated: "If the invasion is to be fought, the best way is by copying American methods. American competition does not hurt us, as the French automobiles are sold at the same price always and have the preference of 75 per cent. of the buyers. It is a mistake to imagine we could not produce automobiles as cheap as America, as labor is cheaper here."

M. Dury of the Turcot-Mery firm, contented himself with the statement that "there is no need to fear American competition here."

So far as the French makers are concerned, as appears from the Paris report, the Geneva congress was merely a gathering of alarmists, as the European makers do not fear competition with high priced machines, trade in which is their staple line. Such being the case, they take the stand that America's cheap machines have a decided place in their market. The same is held to apply in England, although perhaps to a lesser extent.

### SALTBURN SPEED TRIALS.

#### American Cars Show up to Advantage in at Least Two Events.

The speed trials on Saltsburn sands, England, have come to be considered as part of the annual series of classic events held in that country. The number of competing cars this year was a record one and all of the 19 events on the programme were carried off promptly. In the absence of a quick drying sun the surface was soft and wet and the heaviness of the course doubtless retarded the cars. This was especially so on the side nearest the sea.

The cars were started on boards, these being about 30 feet in length, but the dampness of the tires caused considerable slipping. In event N, the winner proved to be an American car, A. E. George's 20 horsepower Ford. In the first heat,

J. Atkinson in a Bedford-Buick won, the time being 50.8, or a rate of 44.03 miles an hour. Others in this heat were E. Lisle in a Briton; Rowland Winn, Ford; J. Stringer, Winco. This was a very close race, the Ford, fitted with a pointed radiator, losing by only a length.

The second heat was won by A. E. George in his Ford, the time being 46.2, or 48.41 miles an hour, the margin of victory being about 40 yards. Other cars were H. Nelson Smith, Hillman; W. H. Isherwood, Salmon. In the final the time made by the Ford was 45.6, or 49.26 miles an hour. The prize for this race was the Royal Automobile Club's gold medal and the Y. A. C. cup.

In the final of event P, J. Atkinson in a Bedford-Buick won and J. D. Gray in a 28-32 Buick was third, second place going to Nelson-Smith in a Hillman. Five heats besides the final were necessary in this event, owing to the fact that in no less than three heats the winner was disqualified because of exceeding his speed allowance. Among these was Rowland Winn in his Ford, he having won the second heat.

### NEWS NOTES FROM FOREIGN LANDS.

An enterprising baker at Eaglehawk, Victoria, Australia, has demonstrated the advantages of motor delivery by installing a light van, with which he has been able to extend his delivery into the surrounding districts and thus materially increase his business.

The authorities of the Swiss canton of Glarus are still showing a strong anti-motorist tendency, having forbidden the driving of motor cars on Sundays between the hours of 9 in the morning and 6 in the evening, during the months of May, June, July, August and September, throughout the entire canton.

The Austrian postal authorities recently placed in service 30 electric motor mail vans for use in Vienna and suburbs. The machines are used principally for the transportation of mail to and from the railroad stations. A new postoffice garage, capable of housing 50 electric, has been erected in Vienna.

The automobile is coming more into use in Sweden and the trade during 1912 was better than in 1911, when 532 automobiles, valued at \$434,080, were imported. Of this number the United States supplied 93, valued at \$80,162; Germany led the trade with 199, valued at \$184,958, while Belgium sold 107, valued at \$60,422. Only Germany can be considered a serious competitor. Its proximity and the granting of long credits accounts for its success.

Recent reports from South Africa indicate that the average cost of running motor vehicles in that district is about 12 cents a mile. This is held to include use in towns and open country, although in the latter instance it is found that mere tracks exist in lieu of roads. The inhabitants are rapidly coming to recognize that the success of mechanical transport depends very largely upon better highways and a movement is under way to further good roads work in several localities.

As a result of the recent competitive tests held at Ciulnita, Roumania, under the direction of the Sindicat Agricole of the Jalomitza, a co-operative agricultural institution, gold medals were awarded to two American houses, the Emerson-Brantingham Implement Company and the Pioneer-Isacelles. Three silver medals also were given to American machines. The cup of honor was awarded to the Lanz firm of Mannheim, Germany. The names of the winning American machines were not forwarded to this country.





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**THE GRADE CROSSING.**


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It undoubtedly is true that it would prove a financial impossibility for the railroads of New York State, or in almost any other section for that matter, to eliminate all of the dangerous grade crossings in one year, or possibly in 10, as suggested by the Touring Club of America in a communication to Gov. Sulzer appearing elsewhere in this issue.

The attempt of the organized motorists in New York City to secure better conditions in this respect is praiseworthy, but there is room for much criticism in the remedy suggested in the letter to which reference has been made. Briefly, the Touring Club would ask the railroads to erect a permanent barrier, which must be operated by the highway user. Undoubtedly this

would protect the motorist, but why should he be compelled to act as his own gate tender?

Modern traffic conditions demand that the grade crossing shall be eliminated in the interest of public safety. The railroads also have a financial interest at stake, since it can be argued, solely on economic grounds, that it is cheaper in the end to provide against accidents than to meet the expenses attendant upon them. There ought to be no reason why the railroads should not be compelled not only to erect suitable barriers, but provide men to operate them so long as the financial need for maintaining the grade crossing continues to exist.

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**INTERNATIONAL ROAD CONGRESS.**


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It is impossible to measure the results of the international road congress held every third year, for the reason that much of the business is in the form of reports and recommendations contained within printed documents which will later be assembled for distribution to highway authorities throughout the world. There is little doubt, however, that the conference held recently in London, England, was of decided value to motorists.

Three important decisions were reached, although, of course, none of these has the force of legislative authority. The representatives of 39 governments, after full and free discussion of the problems involved, have expressed as their opinion that the proper method of regulating traffic should be based on the principle of allowing the speed practicable for each different kind of vehicle consistent with public safety, general convenience and the normal wear of the roads; that it is impossible to light the roads in a way adequate for modern traffic, therefore the user must carry his light with him, and that it is important, both in the interests of the duration of the road and the comfort of the users, that repairs should be made immediately a defect shows itself.

These decisions have the effect of recommendations. Unfortunately, although the United States was represented by delegates, the national government, as such, has no power to act upon the recommendations. This power is relegated to the several states, and to these is officially presented the principles of reasonable and proper speed regulation, universal lighting and some method of road patrol which shall bring to light the defects as they appear.



## ELIMINATING THE GEARSHIFT LEVER.

### Adoption of Electrically Operated Transmissions Announced by Several Makers--- Construction and Operation of Other Forms, Pneumatic, Hydraulic, Etc.

**W**HEN one considers the thoroughness of the motor car manufacturer in equipping his product with time and labor saving devices, as

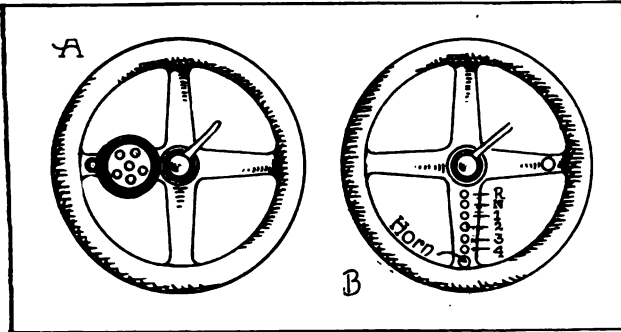


Fig. 1—Control of Vulcan Electric Gearshift: A, Form Utilized on S. G. V. Car; B, Suggested Location Making for Convenience.

well as those making for comfort and convenience, it is but natural to indulge in speculation as to what the 1914 season will bring forth. There are some who will contend that the manufacturer can only incorporate minor improvements and refinements in his new models, a contention based on the 1913 equipment, but it may be anticipated that the progressive maker will give further evidences of his ingenuity. The very general adoption of motor starters and electric lighting, indicates that the effort of the designers is toward relieving the motorist of all manual labor, other than steering and acceleration, in the operation of the car.

This is in decided contrast with conditions existing several years ago and before the equipment was given serious consideration. Placing a spare tire on the rim and inflating it was real work. Now the demountable rim with quick detachable features and power tire pump enable rapid changes with a minimum of labor. The perfected ignition systems, with the magneto as the main source of current supply, has relieved the motorist of the care of batteries, other than an auxiliary. The raising of tops can be accomplished by one person, and curtains may be attached from the inside, an operation formerly requiring two, while the motor may be started and lamps lighted or extinguished from the seat by pressing a pedal or turning a switch button. Seat control is very much in evidence, it being possible to regulate the mixture, while gauges indi-

cate the supply of fuel and lubricant. These and numerous other devices and the stability of the modern automobile has reduced the labor attendant upon motoring to a minimum as well as made it possible for a novice to complete successfully long tours with comfort.

In considering the possibilities of the future; that is, devices eliminating exertion on the part of the operator, there remain two factors—the changing of speeds and the application of the brakes. That the leverless gearshift is being given consideration by the manufacturer was evidenced by the adoption of an electrically operated transmission displayed for the first time on an S. G. V. car at the Boston show. And there is reason to believe that other forms will be seen at the 1914 shows, in that several transmissions operated by compressed air, fluids, etc., have been announced recently.

All of these permit of a change of speed or shifting of the gears in the gearset, by pressing a button, as with the electric type, or by moving a lever on the steering wheel or column. The inventors of these systems point out several advantages, these including safety, in that a change of speed may be made without removing the hands from the wheel; and convenience, in that the control unit is very accessible and a change easily and quickly effected, and that operation in traffic is facilitated as a contemplated speed may be set in advance, thus saving time. It is

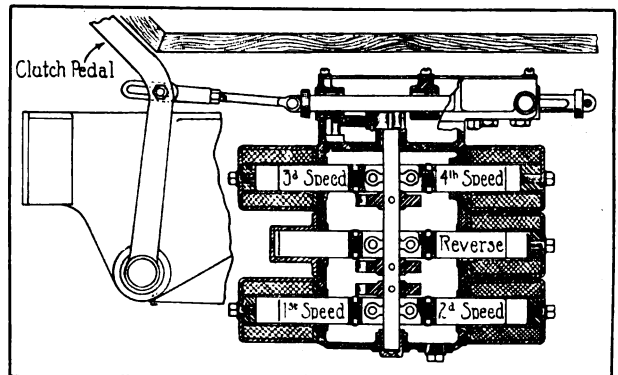


Fig. 2—Sectional View of Vulcan Electric Gearshift, Showing Solenoids and Clutch Pedal Control of Knife Switch.

also claimed that with some forms a quieter engagement of the gears is possible and that mistakes in shifting are avoided.



In presenting the various forms of leverless transmissions no attempt is made to describe all designs, but to explain the principles involved, their application and the method of operation of a sufficient number of types to familiarize the reader with the subject.

The leverless transmission may be divided into three classes, namely: Electric, compressed air and those of the hydraulic type. Dealing with the first named, it may be stated that the system is not complicated, being controlled by solenoid coils, one for each forward speed and reverse. At Fig. 2 is presented a sectional view of the Vulcan electric gearshift as fitted to the S. G. V. car, and the arrangement of the solenoids and clutch pedal control is shown. Two switches are employed between the battery and solenoids, a knife

which method desired speed change is secured.

The plungers are shown in a neutral position in the sketch and when the button is pressed on the control member a 12-volt current passes through the coils around the plungers, drawing them against the magnets. The current required to make the shift is held to be about 17 amperes and it is stated that 300 changes of speed may be made with less current than is required to start the motor. It is also held that gears cannot be stripped because the clutch must be disengaged before a shift is made, and that the gears are always in neutral before the solenoids accomplish the change. This is a purely mechanical action through means of the clutch movement. No two speeds can be utilized at the same time because each speed is governed independent-

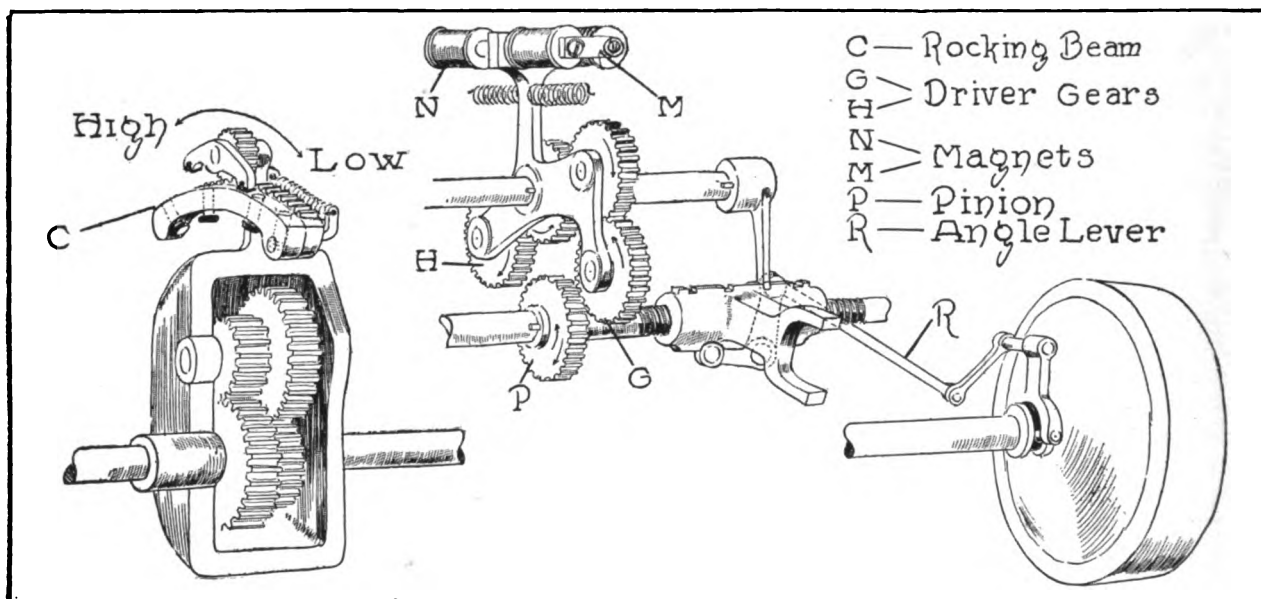


Fig. 3—Schnitzler Electro-Mechanical Gearshift by Which Changes of Gears Are Automatically Governed by the Load—The Driver Has No Control of the Speeds.

switch controlled by the clutch pedal and the push button member located on the steering wheel. The first named switch controls all of the changes, while that on the wheel arranges the circuit for the particular speed desired.

As indicated in the drawing the clutch pedal moves through a link during the first part of its motion and during the balance picks up the link and carries it along with it. Thus it will be seen that the first movement is the conventional operation of the clutch, but the completion of the throw actuates the knife switch, current flowing through the solenoid coil and pulling a plunger against a magnet with a force of approximately 150 pounds. The energy is transmitted through an arm to the gear shifting fork and gear, by

ly of any other and an interlocking device prevents the use of two buttons at once by mistake.

The control buttons and their housing mounted on the spider of the wheel are shown at Fig. 1 A, being designed for a four-speed transmission, and include in addition the conventional reverse and neutral positions. The operation of the system is very simple. If the fourth speed button is pushed down, the clutch thrown out and then re-engaged, the machine will be in the fourth speed. In travelling in traffic on the third, the driver can set the second speed button and by depressing the clutch pedal fully, shift into second. Similarly changes may be made up. If two buttons are pressed at the same time, but one will go down, or if one be pressed while another



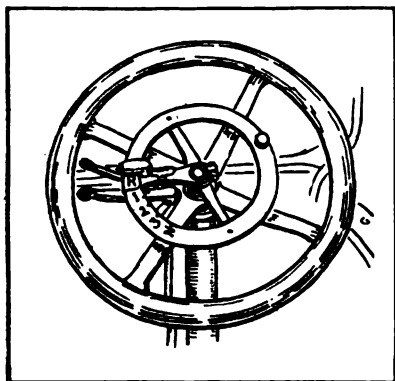


Fig. 4—Control of Gray System.

is down, the latter will jump up. If the second speed button is pressed down while operating in the third, and the clutch depressed fully, the gears will shift regardless of the elapsed time.

The box containing the switches and solenoid coils is mounted at the side of the gearbox and it is stated that it adds but 46 pounds to the weight of the chassis. It is held that the system is quiet, the only perceptible noise being a slight click as the gears engage in the changing to the different ratios. The sketch at Fig. 1 B is a suggestion for locating the buttons in that it would make for greater convenience of operation. This make has been adopted by several concerns since the first of the year.

The possibilities of the leverless gearshift are noted in the Schnitzler electro-mechanical device, designed and patented by Oscar Schnitzler of Minneapolis, Minn. This differs from the one previously described in that the most advantageous gear ratio is automatically provided, the changes being made to higher or lower at the exact time required, and without the assistance of the driver whose only control is the clutch, to start or stop, and a special reverse connection. The principle involved is that of weighing the torsional load on the drive shaft, the selection of the gears being automatically governed by the load.

Two separate mechanical devices, electrically connected, are employed, these being the governor and the shifter. The former, which is the weighing member, comprises two pairs of gears on different shafts, as will be noted at Fig. 3. One pair is secured to adjacent ends of the divided drive shaft, and meshes with the other pair, which is integral with a counter-shaft. The latter is mounted in a casing which is free to rotate on the drive shaft, but restricted by a spring. A section of this case is in the form of an extend-

ing arm, carrying a gear, moving on a toothed rack. On the face of the rack is a series of contact pieces, and a contact arm is provided with corresponding members. The arm is secured by a friction bearing to the pinion.

When the machine is at rest and with no load on the drive, this arm is pulled to one side, the left, for example. Applying a load to the drive results in a tendency to revolve the gear train about the drive shaft, leaving the driven half of this shaft stationary. This rotation, however, is restricted by the spring, so that the drive is transmitted through the gears to the driven shaft. If the road resistance and driving torque be similar, the arm remains stationary at the left. Upon the load becoming greater than the driving torque, and the necessity of a lower gear arising, the resistance of the spring is overcome, and the lever is moved to the right. In this movement contact is made between the stationary contact pieces and those on the rocking member C, which connects with the shifter, actuating the latter and decreasing the gear ratio. A decrease in the road resistance results in the contact member moving in an opposite direction, and changing to a higher gear.

The shifter, contained within the gearset case, consists of a train of four gears attached to a rocking frame, and constantly driven from the drive shaft. These gears comprise a driving, idler and two driven gears, G and H, one meshing with the idler and the other with the driving member, thus being driven in opposite directions. These gears are adapted to mesh individually with a pinion P on the shifter shaft, when the gear frame is rocked to the right and left respectively, thus driving the shaft in either direction. The shifter rod is threaded throughout its entire length to correspond with the shifter sleeve, carrying the shifter fork for the progressive sliding gearset, which is utilized with the de-

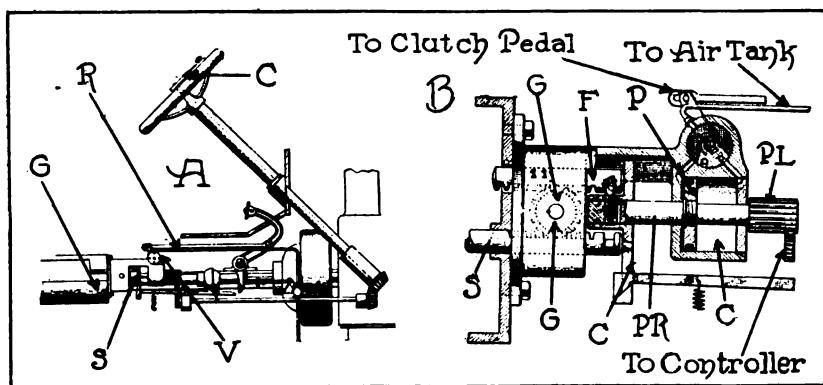


Fig. 5—Gray Pneumatic Gearshift: A. Showing General Arrangement; B. Detailed Section of Shifting Mechanism and Components.



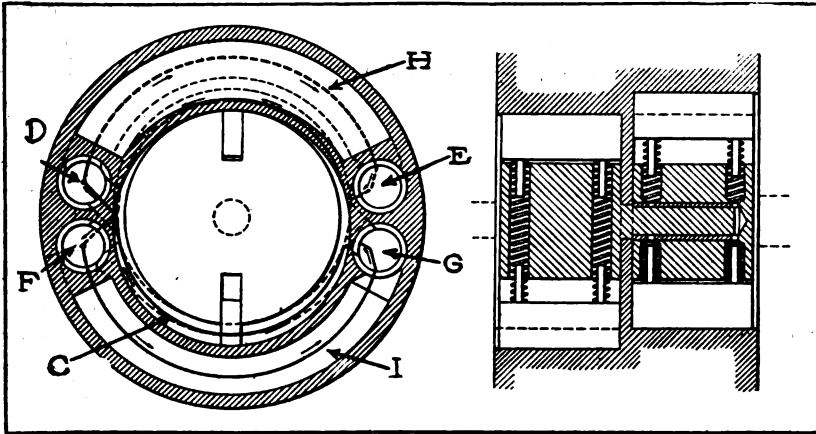


Fig. 6—Showing the Path of Oil in Kerfoot Hydraulic Transmission When Machine Is at Rest or Reversed—There Is No Circulation During Forward Speed.

vice. The rocking frame is controlled by a pair of electro-magnets, M and N, wired respectively to the contact pieces on the right and left portions of the governor segment. An angle lever is connected to the clutch and bears on its roller upon the cam face of the shifter nut, so that upon any movement of the latter wherein a gear is drawn from mesh the roller is raised out of the notch, forcing the clutch out, until the next gear is in mesh, when it drops into the notch opposite, and re-engages the clutch.

The action of the device is as follows: In taking a load, as in starting or climbing a hill, the torsion on the divided shaft is so severe that the case and the governor arm are thrown to the extreme right, making contact at C, exciting magnet M, and rocking the shifter frame to the right. The gear shifter G is thus meshed with the pinion P and the shifter rod is revolved, moving the shifter sleeve backward, throwing out the clutch, meshing the lower gear, and re-engaging the clutch. On the torsion becoming sufficiently less severe to warrant a higher gear being used, the governor arm is drawn to the left, and a contact is made on the opposite side of the governor segment, exciting the magnet N, which draws the shifter frame to the opposite side, engaging driven gear H, which drives the shifter pinion and shaft in the opposite direction. The shifter nut is also moved forward, engaging second speed. In the same way progress is made to the third and fourth speeds, or vice versa.

An example of the pneumatic gear shifter is noted in the Gray system, brought out by the Research Company, Plano, Ill., the components of which are shown at Figs. 4 and 5, the former illustrating the wheel indicator and control. With this device it is possible to start the motor and inflate the tires in addition to gear shifting. A three-cylinder compressor is utilized, which may be attached to the crankshaft as best meets requirements. Its operation is controlled by a pneumatic valve which maintains the proper working pressure. The valves

of the compressor are also arranged so that the unit is converted automatically into an air motor by means of a lever on the dash. When operating as a motor starter the gear ratio is 4:1. As a compressor it is 2:1.

The sectional view at Fig. 5 B shows the components and their relation to one another, while the arrangement of the system is illustrated at A. It will be seen that the Gray system is practically a piston operating in a cylinder and that control is by means of a selector mechanism and an air distributor.

The shifter rods S of the gearset are cut to form racks, and the idler racks I I are differentially geared to the lower shifter racks by means of the gear pinions G G. The extremities of all four racks have slots into which a selector finger slips when rotated by the steering wheel indicator. The selector finger is integral with the piston rod P R, the piston P and the controller long

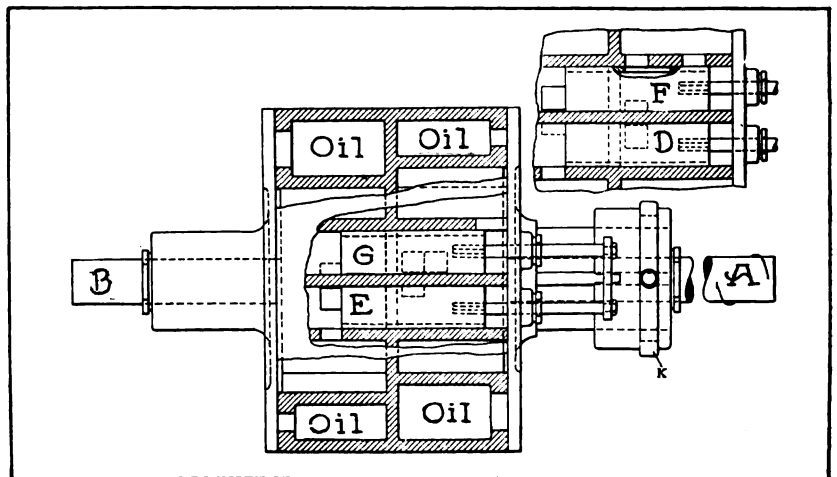


Fig. 7—Longitudinal Section Through Valve Chambers and Oil Passages of the Kerfoot Hydraulic Transmission.



pinion P L. The assembly rotates with the stationary cylinder C, being actuated by the gearing from the steering wheel controller. The function of the racks is to transmit a pushing motion to the shifter rods, when drawn forward by the selector finger on the forward or engaging stroke of the piston, to correspond with the forward slots of the conventional H gate system. The reverse movement, that of pulling the shifter rods forward, is obtained by the direct engagement of the selector finger with the shifter rod slots.

The air distributor is controlled by the clutch position. With the clutch engaged, the valve is closed, but when disengaged, the valve is in the position shown at B, admitting air behind the piston and forcing it backward. The piston rod is provided with a neutral collar, and on the back-stroke throws the forward rod back even with the rest, drawing any engaged gear out of mesh and producing a neutral position. A further depression of the clutch pedal closes one port and opens communication with another one, forcing the piston forward, the finger drawing the rod selected by the position of the wheel controller.

The operation of the system is to first place the gears in a neutral position by a downward pressure of the clutch, then engage the gear indicated by the selector by re-engagement of the clutch. As a certain amount of clutch travel is provided it is possible to slip the clutch as in usual practise. The reverse position on the wheel is provided with a latch to prevent shifting into it by mistake. It will be seen that the operator can move the lever on the steering wheel to second, for example, when driving on the third. Upon depressing the clutch pedal and slowing the car the gears are shifted to neutral, but upon re-engaging the clutch the second gear will be in mesh, this having been performed automatically as above explained.

A device replacing the usual clutch and transmission is the Kerfoot hydraulic transmission, designed by E. L. Kerfoot, Hutchinson, Kan., and shown at Figs. 6 and 7. For a 60 horsepower motor it weighs about 100 pounds, is 12 inches long and 10.5 in diameter. The device comprises two rotary pistons placed end to end with a telescoped shaft, the pistons operating in concentric cylinders with a dividing wall between them. Each piston is provided with two or more recip-

rocating blades actuated by oil sealed in the cylinders, and the latter have hollow sliding valves and ports for controlling the circulation of the fluid. When the ports are closed circulation ceases and the oil is compressed in the cylinders causing the unit to move forward as a whole, and providing a direct drive forward. With the ports wide open the oil is allowed to by-pass, relieving the compression in the cylinders and obtaining a neutral condition of the transmission. Any ratio other than direct drive is obtained by closing the ports partially until the desired compression is produced in the cylinders. For the reverse drive one set of valves is opened, allowing the piston to drive oil from the forward cylinder to the rear in such manner as to cause the rear piston to rotate in a reverse direction. The ports are arranged in such positions as to allow all valves to be attached to a common shifting collar. The extreme limit of valve action is 1.9375 inches.

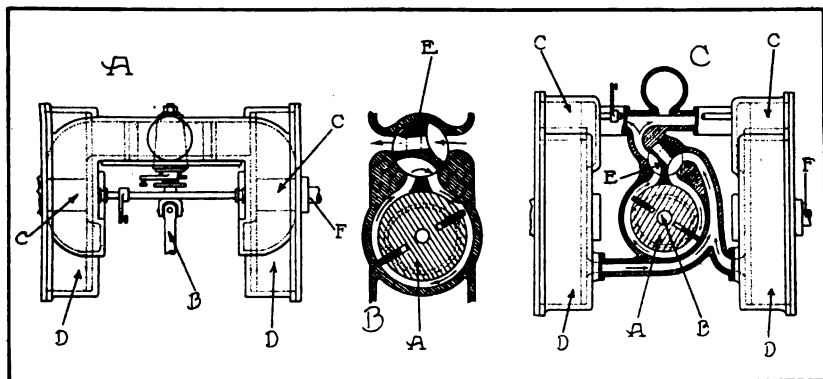


Fig. 8—Schlesari Hydraulic Transmission: A, Pump and Casing; B, Control Cock Operated by Driver; C, Direction of Rotation of Pump and Position of Cock During Forward Movement of Vehicle.

The clutch action is obtained by blades in the driving heads placed radially or diametrically opposite each other, as shown at Fig. 6. These blades are held out against the inside of the body by compression springs. The inner bore of the body is eccentric as regards the centre line of the driving heads. The driving and driven shafts are depicted at Fig. 7 A and B respectively.

To reverse the machine with the driving shaft A rotating clockwise and the valves uncovering the oil passages, the oil circulates as follows: Beginning at C (Fig. 6) in the driving chamber, the oil follows the full line through the port into the cored passage H, following the dotted line into the valve E, passing through this valve into the reverse head chamber, following the dotted line through this chamber into the valve F, thence through the cored passage I into the valve G and out into the driving chamber to C, thus completing the circuit, which is continuous, as the ma-



chine reverses. The blades force the oil out of the driving chamber into the reverse chamber from opposite sides, the oil impinging upon blades in the reverse chamber and causing them to move in an opposite direction.

With the machine at rest, the driving shaft A continues to rotate in a clockwise direction, the valve shifter K being moved toward the body of the transmission until the ports are covered, allowing oil to flow into the reverse chamber. At the same time the other ports are opened and the oil circulates as follows: Beginning at C (Fig. 6) the oil follows the full line into the valve F, through which it passes into the cored passage I and into the valve G. Thence the oil passes into the driving chamber and back to C, thus completing the circuit when the machine is at rest. During this period both the body of the transmission and the reverse shaft are stationary, allowing the driving shaft, which is connected to the motor, to rotate freely.

A forward movement of the vehicle is obtained by moving the shifter K toward the body, closing all ports and preventing circulation of the oil. With the driving shaft rotating clockwise, the blades tend to force the oil held in eccentric oil pockets through the opposite narrow space formed by the eccentricity of the chamber, which in turn creates resistance to the passage of the oil and a pressure in the chamber. This engages the body of the transmission, causing it to rotate with the driver. A similar action in the reverse chamber causes the body to engage with the reverse head, thereby driving the entire transmission and shafts in a clockwise direction and propelling the car forward.

The Schiesari hydraulic transmission, the invention of Mario Schiesari, New York City, sectional drawings of which are presented at Fig. 8, consists of regulating the flow of liquid from the pump to the receiving motors in such manner that the liquid is caused to act against the entire surface of the driven pistons, or a portion of the same. It provides a combination of a pump at constant speed, stroke and volume, but varies speed by varying the surface of action.

The receiving portion of the transmission consists of several pressure chambers arranged side by side by dividing a single chamber into several sections of uniform size. A pump A connected to the motor shaft forces liquid under pressure to a distributor enclosed in the casing C, its function being the distribution of the liquid in the sections of the two receivers D D. Each of the last named controls one of the two rear wheels of the machine, eliminating the conventional differential. The pump rotates in the direction of the ar-

rows indicated at B, and the cock E is utilized by the operator for controlling the device.

With the cock in the position shown at C the oil circulates in a closed circuit, the pump rotating freely. With the cock located as shown at B, the liquid is circulated through the receivers, giving a forward motion to the car. With the cock E properly placed the pump circulates the fluid in an opposite direction through the receivers, obtaining the reverse movement. One of the advantages claimed in the construction is that the motor may be cranked by the energy transmitted by the rear wheels after coasting down a grade by turning the valve E to the position shown at C. The receiving motors are directly connected to the driving wheels of the vehicle, both motor and wheel being mounted on the same shaft F. It is obvious that no gears are required.

In considering the matter of brakes it would not be unreasonable to presume that the future will see at least one set of these members, the service, operated by a small lever on the steering wheel. Compressed air is successfully employed on electric and steam trains and by certain modifications could doubtless be applied to the motor car. In reviewing the present equipment and the possibilities of the future, it may be said that the driving of an automobile will ultimately require no other manual labor than steering.

### A SPLENDID OPPORTUNITY.

#### Government of Mysore, India, to Loan Purchase Price to Its Employees.

As an instance of the recognition that is now given in southern India to the great advantage in using motor vehicles as a means of rapid transport, the government of Mysore has recently announced a scheme of making advances of money or salary to its employees for the purchase of either motor cars or motorcycles. For the purchase of automobiles a grant of \$1334 is to be given, or four months' extra salary, whichever is the lower, and for the purchase of motorcycles and sidecars a grant of \$500 will be allowed, or four months' salary, whichever is the lower.

In either case the money thus advanced is to be repaid to the government in 36 monthly installments, without interest. The loan will be secured by a mortgage which the government will hold upon the motor car or motorcycle purchased. The civil list of Mysore government employees can be obtained of the bureau of foreign and domestic commerce at Washington.



## DEFINING SIDECARS AND CYCLECARS.

**A** MATTER that surely will come up for discussion by the various state legislatures next session is that of defining sidecars and cyclecars. Some commonwealths do not differentiate between automobiles and motorcycles, and others exempt the latter from all or a portion of the provisions. And while in the latter instance it seems to have been the obvious intent of the legislators not to include sidecars in the automobile classification, the wording of the law in some instances is such that no other result can be obtained.

To cite an instance: The Massachusetts law defines automobiles as "all motor vehicles except motorcycles," and motorcycles as "motor vehicles having but two wheels in contact with the ground, and a saddle on which the driver sits astride." Connecticut describes a motorcycle as "a motor vehicle having but two wheels in contact with the ground." Several other states classify motorcycles without attempting to define them.

New Hampshire appears to be about the only state that has recognized the sidecar in its recent legislation, the old law, defining the term motorcycle as applying "only to motor vehicles having but two wheels in contact with the ground and with pedals and a saddle on which the driver sits astride," having been amended by adding, "but a motorcycle may carry a one-wheel attachment for the conveyance of a passenger."

Apparently owners of sidecars are safe in the states of California and Rhode Island. The former describes motorcycles as "all motor vehicles designed to travel on not more than three wheels in contact with the ground," and the latter as "only those motor vehicles having pedals, with the driver sitting astride."

### FINDS CLAUSE UNCONSTITUTIONAL.

#### New York City's Anti-Smoke Ordinance Is Declared Null and Void.

Justice Russell of the New York City court of special sessions finds the so-called anti-smoke clause of the sanitary code unconstitutional, and as a result it is understood that the prosecution of automobile owners for the emission of smoke will be abandoned. The decision is of interest because of similar clauses in the laws of certain states. It reads in part as follows:

Section 181 of the sanitary code makes it a violation to allow dense smoke to be discharged from any building, vessel, stationary or locomotive engine or motor vehicle in the City of New York. The section is unreasonable and arbitrary because of its unqualified and sweeping character, condemning as a nuisance a thing that may or may not be a nuisance, and because it makes no provision for cases where compliance is impossible. Such ordinance, prohibiting as it does the emission of dense smoke, irrespective of definitions, limitations and qualifications, is a restriction upon the owners of private property and repugnant to the provisions of the federal and state constitutions that no person shall be deprived of his liberty or property without due process of law.

### TO ABOLISH GRADE CROSSINGS.

#### Organized Motorists Demand That Governor Bring Matter Before Legislators.

It would appear that the organized motorists in New York City were determined that the dangerous grade crossing shall go. The Manhattan Automobile Club, the Automobile Club of America and the Touring Club of America have united in an effort to secure definite action by the legislature in 1914. The following letter to Gov. Sulzer explains the situation:

The rapidly increasing number of casualties to automobilists on Long Island and various parts of this state, due to the great number of railroad crossings at grade, has caused the officers of the Touring Club to give much thought to a possible remedy for this unfortunate state of affairs.

It has occurred that if your excellency could see fit, at the next regular session of the legislature, to present a message on the subject of grade crossings some remedial action could be taken for the protection of automobilists using the roads, as well as for the protection of the railroads themselves. Of course it is patent that it would be quite impossible to eliminate all grade crossings in a year, or even perhaps a decade, but something might surely be done to safeguard the users of the roads from the danger attendant upon crossing lines of railroads.

Would it not be possible to arrange for gates at all trunk line crossings, such gates, for example, as these: Iron gates spanning the width of the roadway on either side of the railroad's right of way which would be fitted with spring hinges and be constantly closed to motor and horse traffic. This would make it necessary for the driver or other occupant of the vehicle to dismount and hold the gate open while the vehicle was crossing the right of way, and the same process would have to be repeated on the further side of the railroad. Naturally one might expect a great hue and cry to be raised by the users of the roads citing the inconvenience of constantly stopping and opening gates; but the very inconvenience would prove a device to insure against reckless and heedless crossing of railway lines by motorists and others who are far too prone to take unnecessary chances.

It is the opinion of the officers of the Touring Club that the railroads in question would welcome any such method of protecting them from damage claims; and it might therefore easily be possible that the railroads would be willing to stand a proportionate share in the comparatively meagre expense of erecting some sort of barrier.

Hoping that you may see your way to take speedy action in this matter, we are, yours very truly,

H. D. BRANDYCE,  
Secretary of the Touring Club of America.



## CORRESPONDENCE WITH THE READER.

**Types of Armatures.**

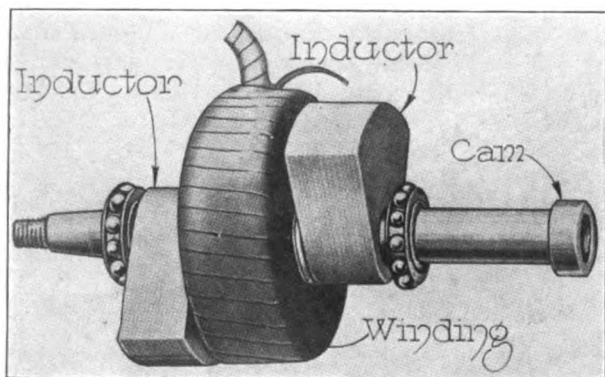
(1622)—Your article on ignition in the Touring Number was very interesting and instructive. I note mention made of the kinds of magnetos, and that an inductor is made. Being interested in ignition I would like to have you explain to me what the difference is between the various armatures made; that is, the simple, compound and inductor, as mentioned in the story.

INTERESTED READER.

Wilmington, Del., July 23.

With the magneto utilized for ignition purposes, the electricity is obtained by either rotating an armature having windings, or by revolving laminated steel pieces called inductors within a stationary winding, in the magnetic field. The inductor type is shown at Fig. 1, this being the Remy, while the revolving armature carrying windings is depicted at Fig. 2. The latter design may be simple or compound.

The simple design comprises the armature on which is placed a winding of coarse wire, and



**Fig. 1—Remy Inductor Type of Armature Employing a Stationary Winding, the Shaft Carrying the Inductors Rotating.**

by rotating it within the magnetic field electrical energy is obtained, this being collected by brushes, rings, etc., and led to a step-up coil, where it is transformed into a high-tension current, as explained in the ignition article to which reference was made. The current obtained from the rotation of the armature is, therefore, a low-tension, but as it is distributed by the magneto after being transformed into a high-tension, the instrument is termed a high-tension magneto.

The compound armature carries two windings; that is, in addition to the coarse or primary, a winding of fine wire termed the secondary, in that by its incorporation a high-tension current is induced in the instrument itself. This type of magneto is termed the true high-tension to distinguish it from other types. It does not require any coil or transformer. By referring to the illustration at Fig. 2 it will be seen that a con-

denser is also incorporated and that the current is collected from a device termed a collector ring. The simple armature is similarly arranged with the exception that there is but one winding, the primary.

The inductor type, shown at Fig. 1, has a stationary winding of coarse wire rigidly held between the pole pieces to which are fitted the permanent magnets. The only rotating mechanism of this construction is a solid steel shaft upon which are mounted two simple inductors of laminated steel, one on either side of the winding. This particular design is such that at each half-turn of the inductor shaft the direction of flow of the lines of magnetic force through the winding is reversed, producing in the winding two electrical impulses for each complete revolution.

The stationary winding is directly connected through the magnetic circuit breaker with the primary of the step-up transformer coil utilized with the instrument. The circuit is mechanically broken when the current has attained its maximum value. The timing of the spark is accomplished by shifting the circuit breaker around the inductor shaft, to which is secured the circuit breaking cam. With this design collector rings, brushes, etc., are eliminated, and it is held to make for great simplicity and durability, as well as a compact instrument.

**Motor Overheats.**

(1623)—I am troubled with my motor overheating. The ignition is good, valves timed properly and the circulation system is right, as the water appears to circulate. The carbon was scraped out within a few weeks.

K. E. H.

Columbus, Ind., July 22.

If the motor components are in good order as stated, it is possible that a too rich mixture is being utilized. If the cooling system includes a pump, inspect this member and note if a screen is incorporated. Sometimes the screen becomes clogged with dirt, impairing the circulation of the water.

**Whistling of Exhaust.**

(1624)—Lately I am bothered by the exhaust making a whistling noise. If I open the cut-out the noise ceases. What is the cause and how can it be remedied?

SUBSCRIBER.

Cincinnati, O., July 25.

The fact that the whistling noise referred to ceases when the cut-out is opened would indicate trouble with the muffler. It is possible that some of its passages are so obstructed as to produce the effect named. If the muffler has not been cleaned for some time and considerable lubricant



has been used, it would be a good plan to disassemble the silencer and remove all deposits. Sometimes this may be done without removing it from the chassis, by gently tapping the walls with a wooden mallet. The loosened deposits may be displaced by starting the engine.

#### Paraffine Wax in Fuel.

(1625)—Will you please explain what value is obtained by dissolving paraffine wax in gasoline for use in internal combustion motors? What other elements could be used to increase the explosive value and what effects would they have on the engine?  
M. P. O'F.  
Boston, July 25.

The only advantage, if any, in utilizing the material referred to in the fuel, is that of lubrication. In placing the wax in gasoline one is simply putting back that which has been taken out in the distillation of the crude petroleum. In the opinion of the writer the cost of the wax and trouble of using it would not warrant any increased lubricating qualities that might be obtained.

There are several fluids that could be used or mixed with gasoline to increase vaporization and combustion, among which may be named picric acid and sulphuric ether. It is not advisable to experiment with either of these unless one is familiar with their properties and the proportions required.

Camphor has been experimented with abroad to increase the vaporization of gasoline, but those who have tried it report widely varying results. It has been utilized more with benzol, which is slightly more difficult to vaporize than gasoline. In the opinion of the writer it is best to use standard fuel rather than experiment, which may prove costly.

#### Second Hand Magneto.

(1626)—As I am contemplating the fitting of a magneto to my car I would like your opinion as to the advisability of buying a new or second hand one. I have had a second hand Bosch offered me by a chauffeur who says it is in good condition, and the price is very satisfactory.  
ADVICE.  
Boston, July 27.

The old saying in connection with motoring, "The first wear is the best," will apply to the present case. However, the writer knows of second hand magnetos which have run for thousands of miles and have given perfect satisfaction. It would depend upon the condition of the instrument and the care that it has been given. It is suggested that it be taken to the nearest service station for examination by an expert. If pronounced in good condition there is no reason why it should not be used as suggested.

#### Wiring Electric Horn.

(1627)—I purchased an electric horn, ordering it through the mail. It came without any directions as to

fitting. There appears to be only one wire; that is, a twisted wire which is split at the horn end and attached to two posts. The balance of the wire seems to be a single member and has a push button connected in it. I am told that to connect up the horn with the battery, one side of the wire is cut and secured to the battery posts. Does it make any difference which side it is?  
J. W.  
Wood River Junction, R. I., Aug. 1.

The side to be cut would depend to a certain extent upon the installation of the push button and horn. The push button is a switch which closes the circuit, allowing current from the battery to flow to the horn. The latter is provided with two connections, a positive and negative side, for example, and these must be attached to the positive and negative poles of the battery. If two wires were thus fitted and no break or switch provided in one of them, the horn would continue to sound as long as current was supplied by the cells. By depressing the button or closing the switch the electricity is utilized as desired. Normally the switch breaks the circuit. It should be

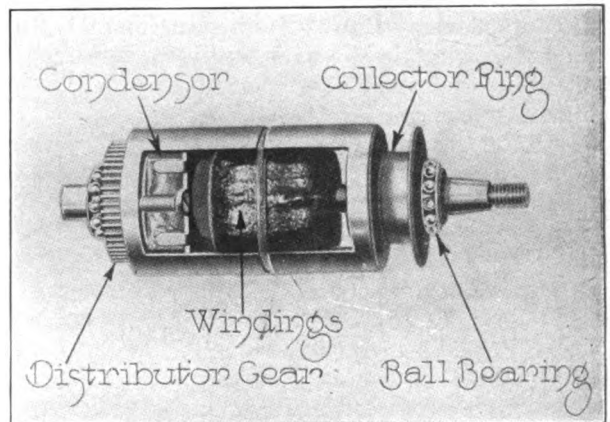


Fig. 2—Compound Type of Armature Carrying Two Windings, Which Rotate Within the Magnetic Field as a Unit.

remembered that for electricity to flow a path must be provided. This is termed a circuit in that the current is supposed to leave the battery at one terminal, flow through the circuit and return to the other post.

#### Cylinder Missing Explosions.

(1628)—Would you be kind enough to forward information regarding my Overland car? It is a 1910, model 38, which I overhauled recently, but upon completing the work I find that only three cylinders fire. I have had the magneto adjusted, also the carburetor. The spark plugs are in good condition, the cylinders have good compression and everything seems to be in good shape.  
T. P. H., JR.

Elizabeth, N. J., Aug. 2.

It is difficult to state what is the trouble, with only the data submitted, and especially if the components are in proper order as mentioned. If the valves seat properly, open and close at the right time, and the cylinders are getting mixture,



they should fire, provided the spark occurs as it should.

A systematic inspection should reveal the cause of trouble. Check the timing of the valves and note if both the intake and exhaust members close and seat. The compression would indicate faulty seating, but it may be checked by using a gauge. If the timing is correct and the valve springs in order, check up the ignition. Make sure that the spark takes place at the proper instant and that a good flame exists. Test the plugs by laying them on the cylinder and noting the spark.

Examine the wiring, being careful to note if any of the secondary leads come in contact with metal. If the cables are old, it is possible that the high-tension current may penetrate the insulation and ground, rather than bridge the gap of the plug. This sometimes produces a condition similar to the one mentioned, in that in testing the plug out of the valve cap, the cable is moved out of contact with or away from some metal. Running the motor in the dark will invariably enable one to locate the leak, which will be noted by the blue flame.

Water leaking into the combustion chamber would have a tendency to kill the mixture. As previously stated, a systematic search should reveal the trouble. If new gaskets were fitted to the intake pipes or manifolds; that is, between these members and the cylinder, make sure that in making the gasket the centre was cut out. The writer recalls several instances where the failure of a cylinder to fire was due to the workman obstructing the entrance of the mixture by an improperly constructed gasket.

#### **An Exhaust Problem.**

(1629)—I fitted a horn operated by the exhaust of the motor to my machine which has a pressure fuel feed. The horn was attached as directed by the maker, the work being done at a garage. Upon using the car I found that it was difficult to keep my pressure at the necessary point until the car was run at high speeds. Upon removing the horn, the trouble disappeared. Tests proved that it was due to the horn. I was informed that the difficulty was due to back pressure. As the car was overhauled just previous to putting on the horn, and the muffler cleaned, I am at loss to know why the horn should affect the pressure feed. INFORMATION.

New York City, Aug. 6.

The case is the first of its kind that has come to the attention of the writer, who is at loss to account for the trouble unless it be the back pressure mentioned by the repairman. While there would be some back pressure when the signal was being operated, it should not affect the fuel pressure when not in service. It is possible that in attaching the horn the normal flow of the gases was obstructed. It also may have been due to

the check valves of the pressure system not operating properly.

#### **Electric Gearshifts.**

(1630)—Noting an advertisement of a certain make of car, stating that it would have an electric gearshift for 1914, I would like some information on the subject. Is there any advantage in one of these, and why is not the good, old fashioned lever good enough? E. B. T.  
Kansas City, Mo., Aug. 7.

The subject of electrically operated transmissions, also those operated by compressed air and fluids, is discussed and illustrated elsewhere in this issue.

There are several advantages claimed for the systems. In the first place they prevent undesirable stresses to the motor and driving components, as frequently an operator will endeavor to climb a hill on the high when he should shift to a lower gear, or start from a standstill on the second speed. This is often due to his disliking to change speeds. With the electrical device an anticipated change is provided for by pressing a button and the shift is effected by depressing the clutch. With some automatic types the driver has no control of the gears, these changing automatically whenever the load warrants.

The newer type of transmission will appeal to women in that it relieves them from manipulating a lever. And it should be borne in mind that in starting a car from standstill, three lever movements must be made with a three-speed transmission and direct drive on the third. The changing of speeds is not always effected easily by some drivers, resulting in more or less wear of the gears.

Regarding the last question: It may be stated to be a matter of opinion. There are some old time motorists who view the motor starter and left hand drive with disfavor, but their very general adoption is indicative of their popularity and practicability.

#### **ANOTHER WISCONSIN LAW.**

##### **Provides Heavy Penalty for Motorists Who Run Away After Accident.**

It would appear that the Wisconsin legislature was busy with new automobile laws during the recent session. Among the changes is the following:

Any person operating an automobile, motorcycle or other similar motor vehicle who shall injure any person therewith and fail to stop and give assistance, his name and address of the owner of the automobile, motorcycle or other similar vehicle to the person so injured, or to any bystander who shall request such information, shall be guilty of a felony, punishable by a fine of not more than \$1000 or by imprisonment for a period not less than three months nor more than two years.



## IN THE COMMERCIAL VEHICLE FIELD.

### Possibilities of the Motor 'Bus or Char-A-Banc in Competition with Suburban Trolley Service—Features of Eldridge Front Wheel Drive Cart.

ONE of the interesting features of the recent visit of the members of the Institute of Automobile Engineers of Great Britain to this country was the comment made by several of the engineers concerning the possibilities for the motor 'bus, or char-a-banc, as it is more often termed abroad, in the suburban sections of this country. These vehicles are utilized in Great Britain, for example, in lieu of tram, or trolley cars in such sections, and many times, as in London, it has been found that the motor 'bus service is the more satisfactory, judging from the financial returns on the investment.

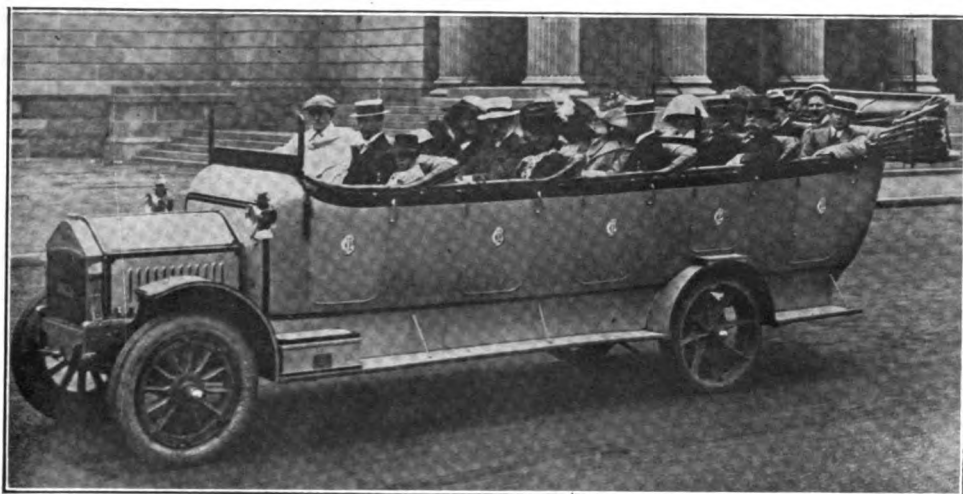
Among the advantages claimed for the motor 'bus is its ability to traverse any portion of the street, thereby lessening instead of contributing to the traffic congestion. This factor also is of importance when considering the matter of picking up and depositing fares, since it is possible for the 'bus to approach the sidewalk, making it unnecessary for the patron to cross a portion of the highway in reaching the vehicle, as when tracks are laid in the centre of the street, the usual practise with trolley lines.

In Great Britain, many of the hotels catering to tourists in the sections noted for their historic or scenic interest, have become enthusiastic over the char-a-banc. A 30 horsepower, 20-passenger machine of the torpedo type, made by the Lacre Motor Car Company, Letchworth, England, is shown herewith, and suggests the design which is meeting with decided favor in this particular field.

Another illustration presents an Albion char-a-banc of the pay-as-you-enter type, this being made by the Albion Motor Car Company, Scotstoun, Glasgow, Scotland, for service in New Zealand. The machine is typical of those utilized

in several of the British colonies and in other sections, where it has not been found advisable to construct railroad lines. The roof and side curtains are arranged so as to provide for all weather conditions, and the interior is designed to accommodate 25 passengers.

A number of motor 'bus lines have been established in this country within the past few months. White, Kissel-Kar, Federal and several other chassis are being utilized for this purpose, and with results which would seem to justify the enthusiasm of the British engineers. An accompanying illustration presents a two-ton Atterbury chassis fitted with a pay-as-you-enter 'bus body, designed to seat 25 passengers. This car



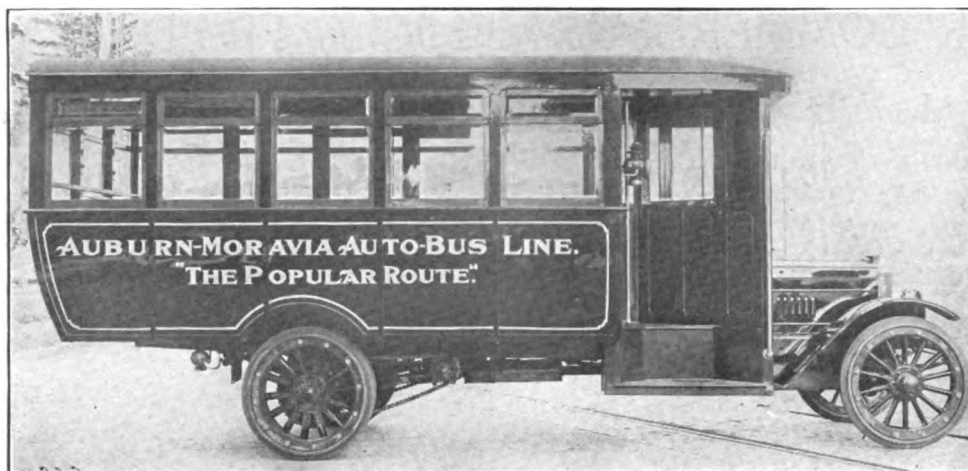
**Lacre 20-Passenger, Torpedo Type Char-A-Banc for Use in Great Britain.**

has only recently been placed in service between Auburn and Moravia, N. Y., a distance of 23 miles, and the fare for the trip is 50 cents.

It will be noted that the Atterbury car, which may be regarded as more or less typical of American design in this respect, does not differ materially from the New Zealand machine shown herewith. The single entrance at the front facilitates the plan of collecting fares as the passengers enter the vehicle and makes it possible for the driver to look after this feature as well.

As an indication of the possibilities with the motor 'bus, the experience of London, England, is of interest. Since 1900 the number of machines in service has increased from 1049 cars to 2527,





**Pay-As-You-Enter 'Bus on Two-Ton Atterbury Chassis for Suburban Service in America.**

and the street-miles traversed from 114.8 to 336.6. The figures disclose an approximate average of 10 vehicles in service a mile of route worked, while similar data for the London City Council electric street cars show an average of 11.5 to a street-mile served. The average speed of the electric car is held to be at least two miles an hour less than that of a motor 'bus. This, of course, is in city service, and opens a field which has not been seriously considered in America, except in a very few instances.

### **ELDRIDGE COAL CART.**

#### **Electric Front Wheel Drive Wagon Designed to Supplant Single-Horse Outfit.**

Exhibited for the first time in connection with the 1913 Boston show, the electric front wheel drive wagon, made by the Eldridge Manufacturing Company, 178 Devonshire street, Boston, has met with decided success in that city. As will be seen by the accompanying illustration, the vehicle is designed to supplant the single-horse equipment in the handling of coal and similar commodities. It is stated that the type was originated by the chief engineer of the

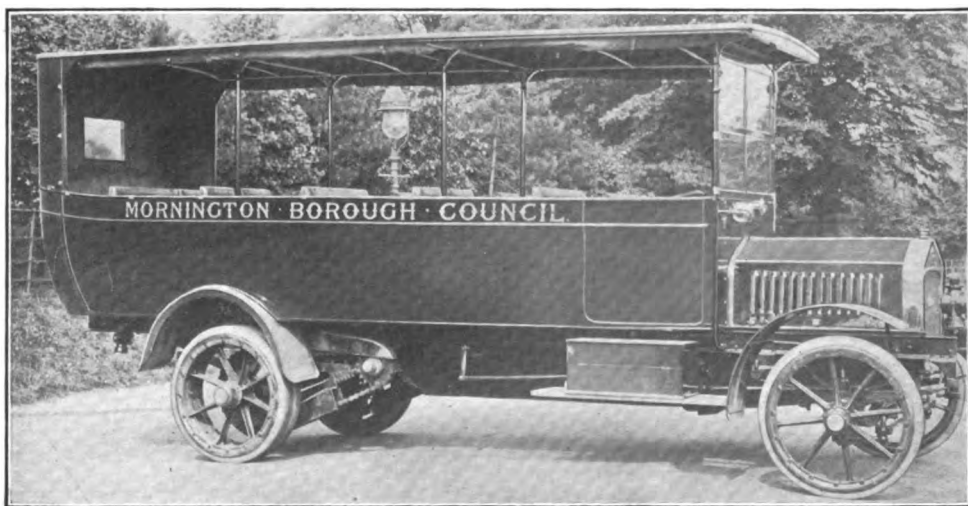
Third Avenue Railway Company, New York City, for hauling ashes, but the construction has been improved somewhat by the Eldridge concern.

The chassis frame is a steel angle that is "necked" from the centre cross section forward, the angle being curved to supply the usual front

cross member. The frame is mounted on a solid axle. The front end carries a heavy cast steel plate, in which is cast a base for the fork that is supported by the front wheel. This plate is bolted to the frame. The driving wheel is mounted in practically the same manner as the front wheel of a bicycle, and its axle is fixed in the ends of the fork.

The motor is installed on this front wheel axle, and is approximately three horsepower, being constructed to sustain about 300 per cent. overload temporarily. The ends of the armature shaft carry pinions that mesh with the racks in the outer edges of the discs that form the wheel, and the reduction is 24:1. On either side of the wheel are brake drums with external contracting brakes operated by a pedal and connected with cable so that the braking influence is equalized.

The fork above the wheel has a heavy shaft



**Albion Pay-As-You-Enter Type of Char-A-Banc Designed for New Zealand Service.**





**Eldridge Electric Front Wheel Driven Cart.**

that exactly fits the base bracket of the plate, and a collar and a large nut that threads onto the bracket retain the shaft. On the upper end of the fork shaft is mounted the 22-inch hand wheel, and while there is no bearing the shaft can be turned easily in the plate.

The battery cradle is below the main frame, back of the front wheel and forward of the rear axle. This cradle is loaded from the side, the sides being removable. It is supported at the corners by heavy lugs that are carried on four guides, with helical springs above and below the lugs to protect it against road shocks and stresses. The controller is mounted upright at the left side of the frame, this being of the street car type and it is supplied with a removable lever.

Directly over the rear axle and attached to the frame are the brackets that carry the body. The body is of heavy sheet metal and is supported by a bar, the ends of which form trunnions that turn in the brackets. The trunnions are carried on helical springs that are compressed when the body is loaded. The floor slopes forward from the rear to the

centre, and when dumped this section is vertical, insuring the complete discharge of the contents.

### A NOTABLE DEMONSTRATION.

#### Interesting Development of the Delivery System of Adams Express Company.

A short time ago, in connection with a motor truck parade in Newark, N. J., the Adams Express Company of that city took occasion to demonstrate the development of its delivery system in a thoroughly interesting manner. An accompanying illustration suggests the exhibit, and it will be noted that it indicates the growth of the system from the beginning until the present.

In front of the procession was a man on foot carrying a carpet bag, a replica of that used by Alvin Adams, when he began to travel as a messenger from Providence, R. I., to New York City in 1840. Mr. Adams went by train and steamer, carrying parcels for persons who at that time desired a quick delivery. As the business extended it became necessary to retire the carpet bag and its immediate successor was the pushcart. Later horses and wagons were utilized, until the advent of the motor vehicle.

Relative to the last named equipment, it may be stated that the first experiment made by the Adams Express Company was in Jersey City, N. J., about 15 years ago. These were steam vehicles and were not found satisfactory. In 1903 the company again took up the automobile in Buffalo and Rochester, and with better success. At present the company has about 500 automobiles, that shown in the picture being a Lansden electric, made by the Lansden Company, formerly of Newark, but now of Allentown, Penn.



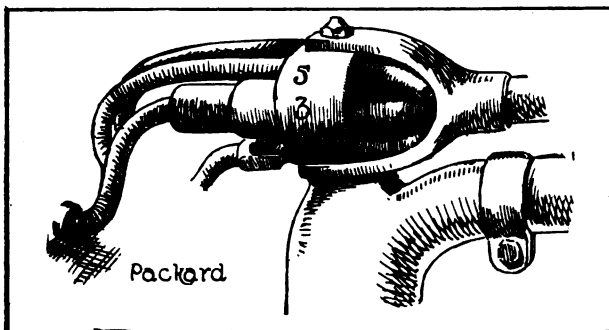
**Exhibit Intended to Demonstrate Development of Adams Express Delivery System.**



## PROTECTING THE HIGH-TENSION CABLES.

### Various Methods Employed to Eliminate the Effect of Mutual Induction---How Water and Dirt Form a Temporary Conductor.

THE owner of the modern automobile, whose experience is limited to the more recent types of internal combustion engines, does not



Illustrating Packard Method of Supporting High-Tension Cables and Numbering of Leads to Facilitate Location of Troubles.

fully appreciate the perfected ignition systems now in service. Instead of a tangled mess of wires, inviting trouble in the shape of short circuits, bothersome coils and exhaustible batteries, are compact, durable, efficient magnetos and simple wiring methods. And in place of yards of primary and secondary wires are a few short leads. Improved terminals and water proof instruments have reduced the care of the present ignition system to a minimum, the magneto requiring no other attention than an occasional oiling.

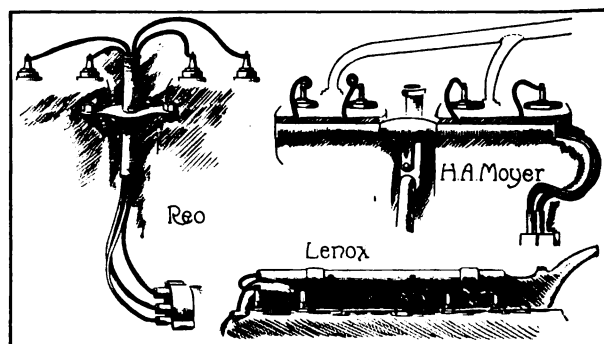
As the high-tension cables carrying the current get severe service, it is well to give these members the slight attention they require. They should not be exposed to the deteriorating action of heat or oil, either of which will in time lay the foundation for trouble in a mysterious miss or a loss of motor efficiency. It should be borne in mind that the wires carrying the high-tension current are subject to a pulsating current of high voltage, but small capacity; that is, the current is small. The uniform carrying capacity of this cable is between No. 14 and 15 B & S gauge. The conducting material is sub-divided into finer wires for the sake of flexibility as well as for mechanical strength. High-tension wires are subject to a capacity effect which is inherent in all high-tension apparatus that carries a pulsating or varying current, such as an alternating one.

This capacity effect is sometimes apparent, especially when the cables are covered with dirt

and water, forming a temporary conductor of greater or less conductivity. It is pointed out by the Packard Electric Company, Warren, O., manufacturer of ignition cable, that this is sometimes mistaken for a break down of the insulation, which is denoted in the dark when a light blue or tiny spark can be seen to jump from the wire to metal parts of the chassis, or to ground.

The company holds that this phenomenon does not indicate that the insulation has broken down or is even weak, for this so-called static effect is apparent in all insulation wires, but is magnified or intensified when the outer insulation is covered with water or dirt. The disagreeable effect of such phenomenon is demonstrated by the fact that a person can experience a severe shock by touching the high-tension cables when they are wet, and if they are run sufficiently close to iron it is possible that enough heat will be generated at a single point where this static current is jumping to the metal, to heat the cable at that point and eventually burn it through until there is an actual break down from the conductor to the iron frame. Under the last named condition a new wire will be required.

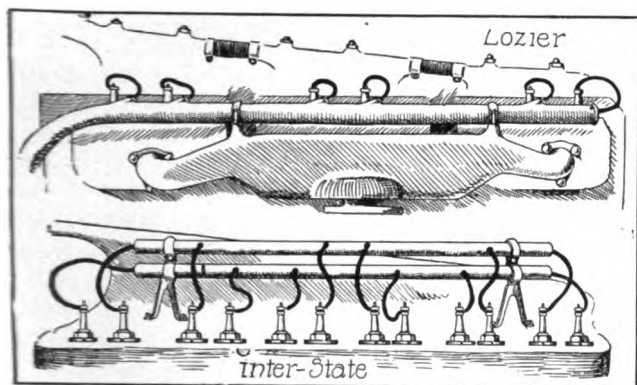
There is another effect to be considered, namely, that of mutual induction. If two wires are parallel to each other and close enough, a supposedly dead conductor will be caused to have generated in itself from the effect of the live conductor in proximity to it, a sufficient voltage to jump across the spark gap of the plug, thereby



The Lenox Employs a Tube Clipped to the Water Manifold and the Reo a Vertical Tube Between the Cylinders—Moyer Design is Also Shown.

producing two explosions at the same time, one of which is, of course, out of time. The effect of the static current on the outside can be reduced





The Inter-State Has Dual Tubes Well Away from the Cylinders and the Lozier a Single Tube.

by sufficiently enlarging the diameter, but this is again limited to the size of the terminals provided on the magneto, coils, etc., and the cost of the cable is also a factor.

For example: Increasing the diameter by two; that is, doubling it, would make the cable contain 267 per cent. more insulating material and would only decrease the capacity effect 36 per cent. The effect of mutual induction can be reduced by separating the cables so that they will be about an inch apart.

It has been held by some that a high-tension cable will leak in service after becoming dry. The Packard Electrical Company states that while it may be true of ordinary cable, it does not apply to a high grade wire. Relative to the usual breakdown tests of a high-tension cable it may be stated that it should be able to withstand successfully at least 30,000 volts, or a voltage corresponding to that which will jump a three-inch gap from sharp points.

The car manufacturer who installs the magneto and wires the system, has given considerable thought to the retention of the high-tension leads and accompanying illustrations present a number of conventional methods. That the maker considers the wiring an important factor will be noted by the utilization of devices which add to the cost of production, and in several instances special carriers have been designed. In practically all of the installations coming to the attention of the writer, the wires are so supported that opportunity for mutual induction is reduced to a minimum.

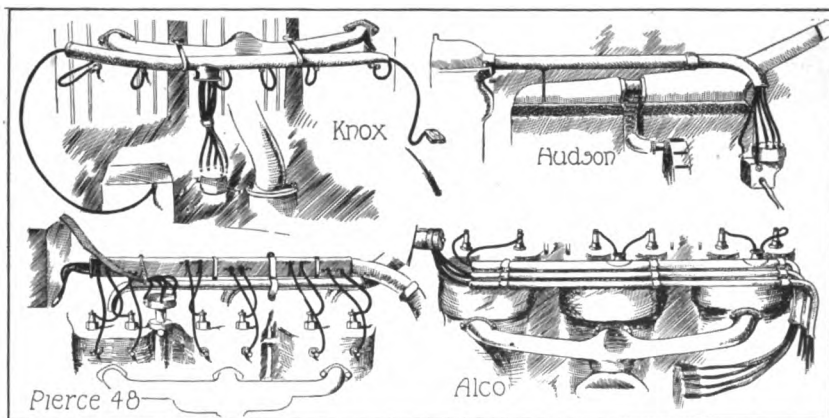
In several instances the wiring has been greatly simplified

by utilizing a numbered carrier; for example, the cable connecting the No. 3 terminal of the distributor of the magneto and the plug of the third cylinder is plainly marked. The Packard 38 utilizes this arrangement, as will be noted by an accompanying illustration, which depicts the special carrier and shows the leads entering a tube. Another Packard model employs a form of numbered block. With both, it is possible for the owner to trace a faulty connection very easily.

The Knox and Hudson employ a tube for carrying the high-tension cables, the former utilizing it also for the leads from the distributor of the battery system. These wires are led from a central opening of the tube, while those connecting with the spark plugs have individual openings. The Hudson carries its wires from the dash through a rubber hood, thence to a straight tube having an end curving downward and ending in proximity to the distributor device of the Delco system employed on this make.

The carriers are not always constructed of non-conductive material, as is noted in the case of the Alco and the Cadillac. The former employs three pipes, the inside member carrying the leads from the magneto, another the wires from the distributor and the third for the primary members. The Pierce-Arrow favors an aluminum carrier, having a flat top, and provision is made for two sets of high-tension cables, two sets of plugs being fitted to the 6-48. The Lozier also affects metal, utilizing a brass tube retained by studs to the intake manifold, and having hard rubber inserts to protect short circuits by possible chafing of the insulation. The Pierce-Arrow adopts similar precautions against opportunity for short circuits.

The dual sets of high-tension wires of the Inter-State motor are carried in metal tubes, one



Showing Differing Installations of High-Tension Cables, Including Those Utilized on the Knox, Hudson, Pierce-Arrow and Alco.



above the other, the container being fitted with suitable insulation where the leads leave the tubes. The latter are carried on special brackets sufficiently spaced from the top of the cylinders. The Fiat carries its wires in a long brass tube bolted to the cylinder studs, and the White also affects the tube design. The last named car encloses its magneto as well, using a leather cover, a practise noted of a large number of cars.

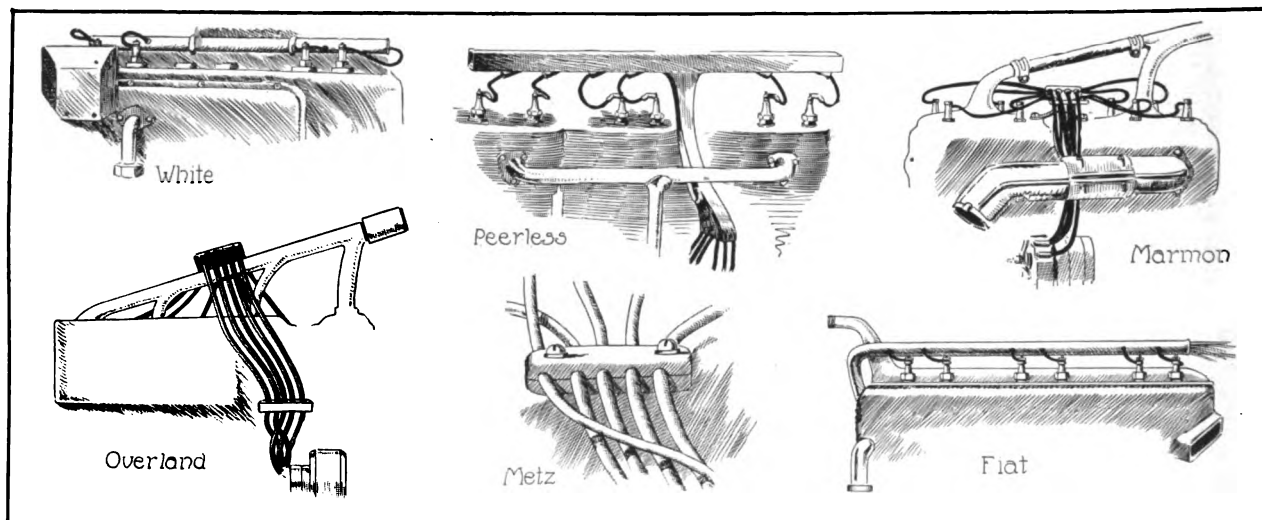
The maker of the Peerless, which for several seasons has employed a hard rubber cable carrier, continues the practise, and the material of the design shown in an accompanying illustration is in the form of a T, the lower portion of which extends very close to the source of current supply.

A number of makes utilize the outlet water manifold of the motor to support the cable car-

riants of the cables but the possibility of short circuits.

Ebony as a support for the cables is noted on one prominent make of car, while others employ metal brackets, fitting the wires snugly to prevent vibration chafing the insulation. There appears to be a wide diversity of opinion as to the proper protection of the high-tension cables, but it may be said that the majority of the manufacturers so attach the leads that they are not subjected to heat, dirt or oils. The practise of some to extend the protective material in proximity to the magneto, thereby preventing deterioration through the action of grease, is noticeable.

There are a few exceptions to the rule, however, and the writer recalls three makes, one a high grade car, on which the wires are strung loosely and without any attempt to provide sup-



Indicating That There Is a Difference of Opinion with Makers as to the Proper Method of Retaining and Protecting the Leads Conveying the High-Tension Current to the Spark Plugs.

rier, among which is the Overland. The design referred to is a split clamp like device of fibre, and it will be noted that the wires are well spaced from one another. Just above the magneto the leads are maintained in a separated condition by another similar holder. The Metz employs a construction very similar to that of the Overland. The leads of the Marmon Six are retained in a bracket between the cylinder units, either end of the carrier being attached to the top of the cylinders. A similar method is noted in the Reo with the exception that the bracket retains a tube passing vertically through it and extending well above the top of the cylinders.

The Lenox carries its wires compactly and with a minimum length. Clipped to the top of the outlet water manifold is a copper tube and the use of rubber inserts not only prevents move-

ports. The general tendency of the car manufacturer to protect the carriers of the high-voltage current and the perfection of the magneto, are responsible for the lack of ignition troubles which existed with motors in the past.

The creditors of the Milwaukee Automobile Dealers' Association, including the racing drivers who won prize money, have received a communication from J. H. Spence, a Milwaukee lawyer, offering a settlement on the basis of about 20 cents on the dollar. Mr. Spence makes it plain that he does not represent the association, but a number of individuals who have contributed a fund for this purpose. The total indebtedness, arising from the running of the Grand Prize and Vanderbilt Cup races of last October, is said to be about \$38,500.



## KING FEATURES CANTILEVER SPRING.

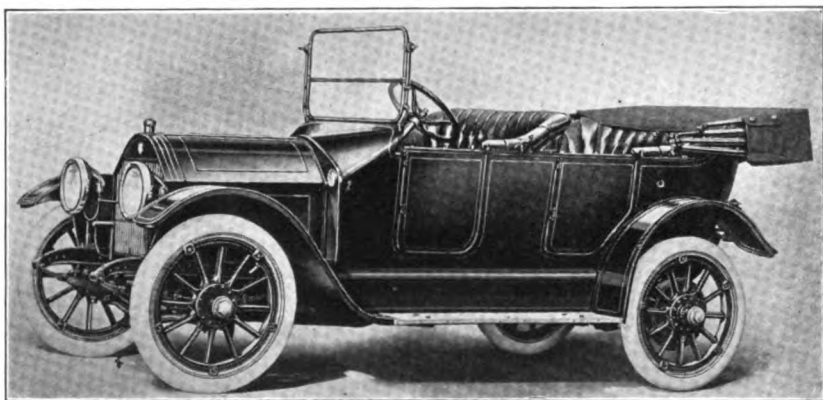
**A** NNOUCEMENT is made of a moderately priced car by the King Motor Car Company, Detroit, the new design, which will be known as the model B, being constructed in one chassis, to which will be fitted five and two-passenger bodies. The new machine is the creation of Charles B. King, who has been prominently identified with the automobile industry for a number of years, and who claims to have designed the first four-cylinder motor cast en bloc in this country. Incorporated in the new chassis are features usually confined to high priced cars, and although the selling price is an attractive one, the best of material and workmanship is incorporated. All details have been worked out carefully by the designer and embody principles indorsed by sound engineering practise. The King car is designed to give maximum service with a minimum cost of upkeep, and the equipment is very complete, including electric lighting and those conveniences making for ease of operation.

The most striking feature of the new chassis is the employment of a cantilever spring designed and patented by Mr. King. It is a modification of the Lanchester spring, utilized on a well known make of English car, and it is held by the maker that it not only eliminates side swing, but is most flexible, providing easy riding qualities, as well as dispensing with shock absorbers or similar devices.

The motor is a four-cylinder unit, L head type, with the cylinders cast en bloc, having a bore of 3.875 inches and stroke of five, which places it in the long stroke class. The company claims that the horsepower production is 30-35, which is ample and in proportion to the weight of the car. The crankshaft is 1.8125 inches in diameter, and has three bearings, these being 3.125, three and four inches for the front, centre and rear members respectively. The enclosed valves have a diameter of .8125 inch and are actuated by roller pushrods, making for noiseless operation. The cylinders are bolted to an aluminum alloy crankcase, the lower half of which serves as the oil reservoir. The camshaft and connecting rod bearings are liberal in size, the latter being 2.625 inches. All components of the power plant are easily accessible.

Carburetion is by the latest type Stromberg, very accessible, and feed is by gravity from the fuel container located under the front seat. Dual ignition on one set of plugs is provided by a Briggs magneto located on the right side of the motor and driven by enclosed gears.

Lubrication is a combined force feed and splash. The oil pump, which is driven by bevel gears from the camshaft, is located in the base at the left hand side of the motor. It draws the lubricant from the reservoir and forces it through a steel tube in the crankcase to pockets over each crankshaft bearing. Holes are drilled in the caps of the latter and the bearings are flooded with lubricant. The surplus then flows to pockets into which the scoops on the connecting rods dip, splashing the oil to all working parts. Each oil compartment has a hole for maintaining the proper height of the lubricant under all condi-

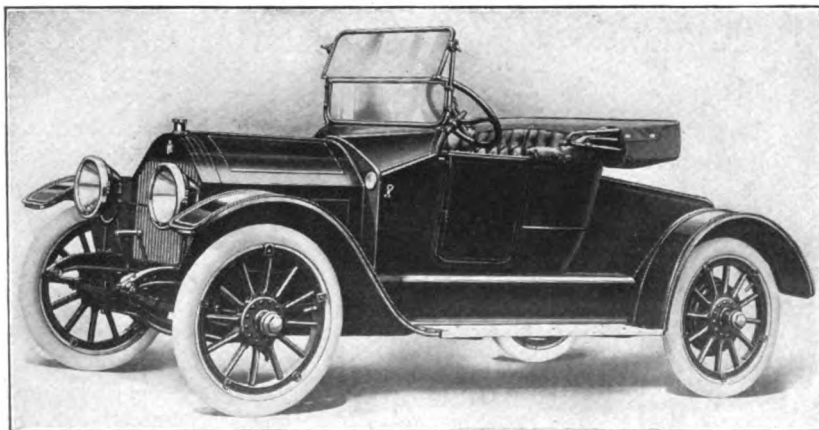


**New Model B King, a Five-Passenger Touring Car with Attractive Lines and Full Equipment.**

tions. The pump is surrounded by a strainer and on the right side of the motor is fitted a gauge having a float to indicate the supply on hand. Cooling is by thermo-syphon, and the intake and exhaust pipes are liberal in size. A six-bladed, pressed steel, adjustable fan, assists in maintaining the proper temperature of the cooling fluid.

The clutch is a multiple disc, comprising six driving discs faced with Raybestos and six driven steel plates. The 12 discs operate in a small amount of lubricant carried in the housing to insure proper lubrication of the pressure plate bearing and clutch shaft mechanism. The clutch is enclosed in an extension of the crankcase and it is held the design is such that thrusts on motor bearings and transmission are eliminated. The spring tension of the clutch is taken by a large ball bearing in the transmission case. Being fully





**King Model B Two-Passenger Roadster in Which Provision Is Made for Carrying Luggage, Etc., Under the Rear Deck.**

enclosed, the entrance of foreign elements is prevented.

A selective, sliding gear transmission, providing three forward speeds and a reverse, is utilized, and the gears are extra large, 6-8 pitch and .875-inch face. The large shafts are of a high grade material and rotate in Hyatt high duty roller bearings. Drive from the gearset to the rear axle is through a Spicer universal joint mounted at the rear of the transmission by a shaft which is enclosed in a substantial and well designed torque tube. It is held that with the car fully loaded the drive is such that a minimum loss of power is experienced.

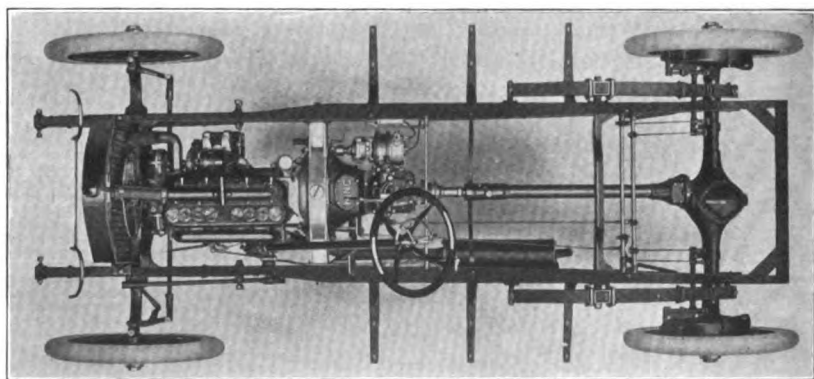
The rear axle is of the full floating type and the design and construction are such as to provide a large factor of safety. The driving gears are very heavy and of coarse pitch, insuring a quiet running axle. A large inspection plate on the top of the differential permits of easy inspection and adjustment of the components. The differential and rear wheel bearings are Hyatt roller. The front axle is of the I beam section type, a drop forging.

The floating cantilever spring referred to is pivotally supported near its centre on a sturdy bracket secured to the frame. The front end of the spring is carried in a slotted bracket or hanger, the latter being riveted to the frame, the construction permitting of end-wise movement, but no side play. The rear end is secured by plates and bolts to a sleeve which pivots on the axle tube. Reverse leaves are incorporated in the springs, each of the latter having one leaf on the underside at the centre

and rear end. These compensate recoil without sacrificing resiliency, eliminate side sway and provide ample road clearance. The front springs are semi-elliptic. The maker of the King lays great emphasis on the spring suspension, maintaining that shock absorbers are not necessary and that the cantilever construction provides maximum comfort over the roughest of roads.

Two sets of brakes are fitted, the service member being of the external contracting type and operated by the conventional pedal. The emergency brakes are internal contracting, actuated by cams, and operated by the usual lever. The drums are 14 inches in diameter, face 2.5, providing ample braking surface. The frame is of pressed steel, having a four-inch section and with side rails .15625 inch thick. No sub-frame is utilized and the usual kick-up at the rear makes for a low centre of gravity as well as stability.

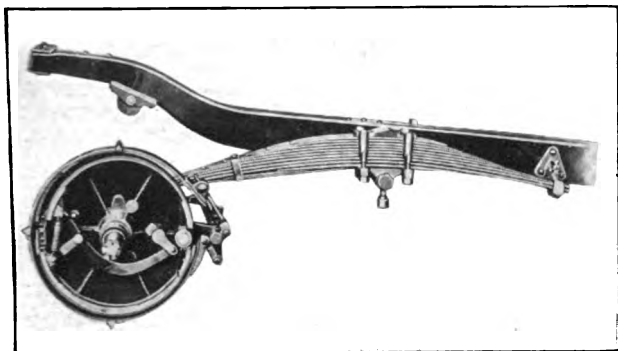
The wheels are of the artillery type, of carefully selected material, and demountable rims are fitted. The tire size all around is 33 by four inches, Goodyear No-Rim-Cut tires being utilized. The wheelbase is 112 inches with tread standard, 56, although an option is given of 60 inches. The steering gear is a Gemmer, of the irreversible worm and gear type, and provision is made for adjustment. The steering column is set at a comfortable angle and is surmounted by an 18-inch wheel. The spark and gas levers are mounted on a sector. The driver is located at the left with the gearshift and emergency brake levers in the centre. The four movements of the



**Top View of King Chassis to Which Two Types of Bodies Are Fitted—Note the Accessibility and Compactness of Components and Sturdy Construction.**



former are very short and the control units are located convenient to the operator. The conventional accelerator is included, as well.



**Illustrating the Suspension of the King Patented Floating Cantilever Spring, a Feature of the New Model.**

The standard electric lighting equipment includes an 80 ampere-hour storage battery, two 11-inch headlights, two side lamps fitted in the dash and a tail light with a license bracket. The Ward Leonard combined electric motor starter and lighting dynamo is listed as extra. This system was fully described and illustrated in these columns.

Two types of bodies are standard, a two-passenger with sloping deck and luggage carrying compartment beneath the deck, and a five-passenger with gracefully rounded back and torpedo shroud. Both bodies have attractive lines and the upholstery is high grade in every particular. The seats are wide and are tilted slightly. The rear seat of the touring car is 48 inches wide and will accommodate three persons comfortably. The leg room, both in front and in the tonneau, is ample. Provision is made for easy entrance and exit to the bodies, the door on the touring design being 20 inches in width, while the front members of both types measure 19. Entrance is possible on either side of the body. The finish is a dark, rich blue, and black and enamel trimmings are utilized throughout. The running boards are noticeable for the absence of fittings, there being no battery or tool boxes to detract from the appearance of the car. The battery is located under the floorboard of the tonneau and is easily accessible for replenishing the supply of water which the cells require for proper maintenance.

The equipment is very complete. The rain vision ventilating windshield, with black and nickel trimmings, has a specially designed channel steel frame, supported by a bracket built into the cowl of the dash, and pivoted near the top, at which point it may be fastened in either a forward or backward position. This eliminates stay

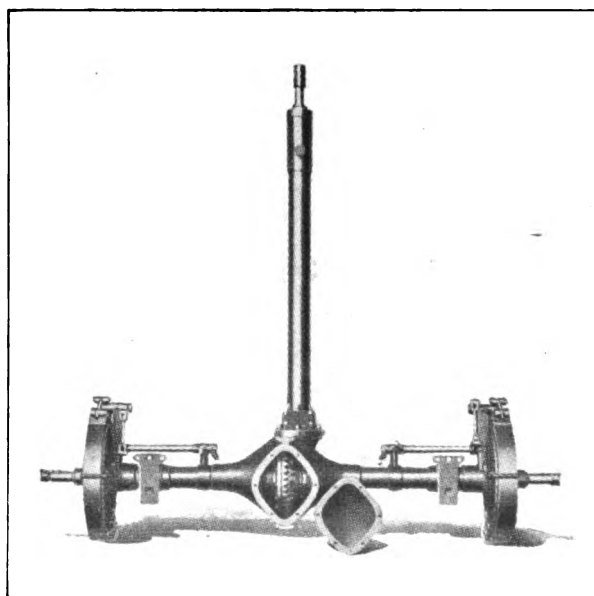
rods, etc. The balance of the equipment includes a silk mohair top with quick detachable curtains, electric horn, tire irons, one extra rim, pump, jack, tools and tire repair kit. The Stewart-Warner speedometer is listed as extra. The King model B will appeal to those who desire a high grade moderately priced car, having ample power to meet requirements under all conditions of service and capable of being maintained at a minimum cost of upkeep.

### HUPMOBILE WINS ABROAD.

**Only American Car Entered in Russian Grand Prix Takes Award.**

Following the winning of the Anderson trophy and Minneapolis Daily News cup by two Hupmobiles in the recent Glidden tour, comes the announcement from St. Petersburg that a 20 horsepower Hupmobile runabout, made by the Hupp Motor Car Company, Detroit, was victor in the first Grand Prix of Russia. This event is an endurance contest somewhat similar to the American Glidden, but the conditions are said to be more severe.

The Hupmobile was the only American car that participated and was taken from the crate in which it was shipped from the factory. As win-



**The Rear Axle Is Designed with a Large Factor of Safety and Bearings and Other Components Are Very Accessible.**

ner the Hupmobile dealer in Russia received a handsome loving cup, presented by the president of the St. Petersburg Automobile Club.

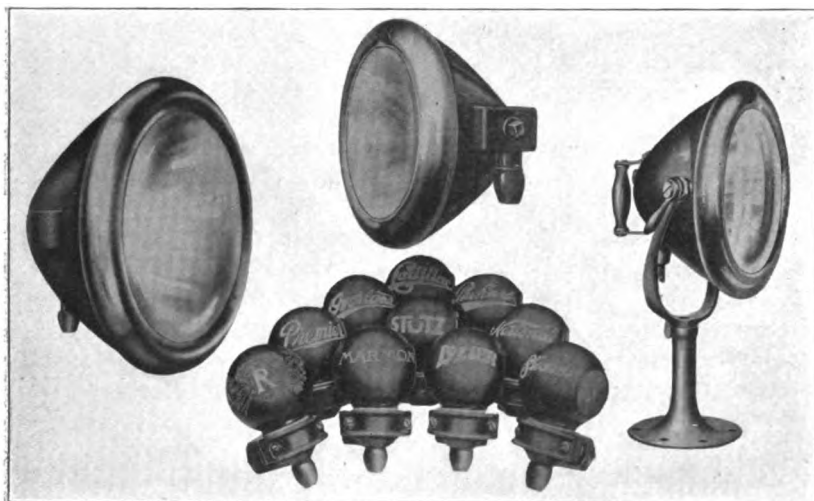


### GOLDEN GLOW LAMPS.

#### Esterline Electric Units Held to Possess Non-Dazzling Qualities.

Announcement is made of new designs of Golden Glow electric lamps, made by the Esterline Company, Indianapolis, Ind., the new types including a dashlight, head, tail and side members, and a motorcycle lamp. The lights produced by this concern are so named because of the peculiar color of their reflected rays, which are claimed to possess superior fog and dust penetrating qualities. The reflector is made of glass, the material being molded in the form of a parabola, ground true and polished on both sides. It is then silvered by a special process to form the mirror. Over the silver coating is a layer of

The searchlight design is being constructed in two sizes at present, the larger being 15.5 inches in diameter and capable of utilizing a 100 candlepower bulb. The smaller is 11.25 inches in diameter and a 25 candlepower lamp is fitted. Both designs are provided with suitable trunnions and brackets for mounting on a flat surface, or on the steering post of a car. Provision is made for rapidly focussing the light by means of a thumb screw and the lamp can be rotated through a wide range in every direction, or locked in any desired position. The design is adaptable for motor boats, yachts, municipal service vehicles, etc. The all-round ruby tail light is another innovation, being spherical in shape and constructed entirely of red ruby glass with the exception of a plano-convex lens of clear glass. It differs from the conventional red rear signal in that the ruby color is discernible from all directions except the front of the machine to which it is attached. A feature of the design is that the name of the car or the owner's monogram may be etched on the globe and may be discernible at night as well as in the daytime. Several designs are presented in the accompanying illustration.



Illustrating Some of the Latest Designs of Golden Glow Electric Lamps, Including Head, Side, Dash and Tail Members.

copper, electrically deposited, a construction which provides a rich golden yellow light, penetrating, but extremely mellow. It is also held that the rays are not tiring to the eyes and do not blind or dazzle pedestrians or vehicles approaching in an opposite direction.

The Golden Glow reflectors are made in seven sizes, these ranging from five to 12 inches in diameter, and are placed in specially designed metal housings. The method of retention is such as to prevent the entrance of foreign elements. The front glass is held in position by means of a number of phosphor bronze springs, and although rigidly secured, is not affected by expansion or contraction due to changes of temperature. Ventilating means also are incorporated. All designs are equipped with a focussing device, this being operated from the exterior of the lamp.

The Esterline company was formerly located at Lafayette, Ind., moving recently to Indianapolis, Ind., as the result of Carl G. Fisher and James A. Allison of the Prest-O-Lite company having become stockholders. The company is occupying a three-story building of reinforced concrete which will be employed for the production of a large variety of Golden Glow lamps.

In order to facilitate deliveries Gray & Davis, Boston, maker of electric motor starting apparatus, has purchased the Sprague-Waldo lamp plant at 19-23 Harper avenue, Detroit, and will take possession Sept. 1. This will give the Boston firm four large factories, two in Boston, one in Amesbury, Mass., which has been enlarged one-third, and the new plant at Detroit.

William M. Hodgkin of Boston reports that he has driven his KisselKar machine, made by the Kissel Motor Car Company, Hartford, Wis., which he purchased June 5, 2550 miles on an expenditure of nine cents, exclusive of fuel. The car has averaged 13 miles to a gallon of gasoline.



## MOTORING SITUATION IN BAR HARBOR.

**M**OTORISTS have been much interested in the outcome of the attempt to open Bar Harbor, Me., to automobile traffic, and some decided misunderstandings have resulted because of lack of knowledge of the situation. Mount Desert island is divided into townships, and the statute of 1909 excluded automobiles from the towns of Eden, Mount Desert, Tremont and Southwest Harbor. Bar Harbor is in the town of Eden. Section 1 of the above law reads as follows:

No automobile or motor vehicle shall be set up, used, driven or operated in or on any highway, townway, or public street within any of the towns of Eden, Mount Desert, Tremont and Southwest Harbor, on the island of Mount Desert, in the county of Hancock, State of Maine.

This act was amended in 1911 so that it read as follows:

Section 1—No automobile or motor vehicle shall be set up, used, driven or operated in or on any highway, townway, or public street, within the towns of Eden and Mount Desert, on the island of Mount Desert, in the county of Hancock, State of Maine.

Section 2—The provisions of this act or any previous act shall not apply to a certain public highway leading directly from said town of Tremont to the town of Trenton, which is defined as follows: Beginning on the highway or road at the Center at the town line between the said towns of Tremont and Mount Desert, thence following the main travelled highway or road in a northerly direction in said Mount Desert to Pretty Marsh Corner, thence in a general northwesterly direction following the main travelled highway or road in said Mount Desert to Smith's Corner, so-called, thence northerly following the main travelled highway or road in said Mount Desert to the Eden town line near High Head, thence northerly over the main travelled highway or road in Eden through Indian Point, so-called, to Bunker's Corner, at Town Hill, thence northerly following the main travelled highway or road in Eden through the Cousens District, so-called, to the town of Trenton; said highway or road to be used for ingress or egress to and from the town of Tremont on said island of Mount Desert to said town of Trenton.

The legislature of 1913 passed an emergency act repealing that portion of the act of 1911, and all other acts, prohibiting the use of automobiles in the town of Eden, and declaring void all by-laws and ordinances of the town prohibiting or restricting the use of automobiles, but including the following section 2:

The town of Eden, in the county of Hancock, and State of Maine, may, at any legal meeting, called by a warrant containing an article for the purpose, close to the use of automobiles and motor vehicles the following townways and highways within its limits: The Norway Drive, so-called, beginning at Liscomb's Corner, so-called, and extending to the Eagle Lake road, near the Young District schoolhouse; the Breakneck Drive between Hulls Cove and the Eagle Lake road; the Ocean Drive, beginning at the bridge at the foot of the hill near the Satterlee property, at Great Head, and extending to the driveway of the Country Club, near Otter Cliffs. Any townway or highway so closed shall be marked at the entrance thereof by signboards in large letters, "No automobiles allowed on this road."

The legislature of 1913 also amended the law as applying to the town of Mount Desert, so that

the section in question read as follows:

The town of Mount Desert, in the county of Hancock, at any legal meeting of the voters thereof, may adopt by-laws prohibiting the use of automobiles on any or all of the highways or townways in said town which said by-law may declare to be for any reason dangerous or unsuitable for their use. Any section of road so closed shall be marked at the entrance thereof by signboards in large letters, "No automobiles allowed on this road."

This amended act was expressly stated not to affect, in any manner, any part of the highway mentioned and described in the act of 1911, referred to above, but it also included the following section 4:

Subject to the provisions of the state constitution hereto applicable, this act shall take effect 10 days after it shall be accepted by said town of Mount Desert at any legal meeting called by a warrant containing an article for the purpose.

At a special town meeting held July 25, the voters of Mount Desert, by a vote of 292 to 18, decided not to accept the act. The town of Mount Desert includes Northeast Harbor and Seal Harbor, two of the most exclusive summer colonies on the island. Among the summer residents who were present and advocated the passage of the vote, were John D. Rockefeller, Jr., and Dr. Charles Eliot, the latter president emeritus of Harvard. Several other summer people expressed their opinion on the matter, all declaring that at present the summer colonies in the town of Mount Desert were practically the only places in the country where it was possible to get away from automobiles and that they desired such conditions to continue.

The business men of Bar Harbor, who have been experiencing the advantages of admitting automobiles to that resort, after a long delay, are not inclined to the opinions which appear to have had weight in Mount Desert. Fearing that the impression might be gathered that automobiles were not welcome in Bar Harbor, the Business Men's Association of the town of Eden has prepared a detailed statement of the situation for general circulation to all hotels and automobile clubs throughout the country.

At a meeting of the officials of Prince Edward Island recently, heed was given to a petition signed by 1700 citizens, and it was decided to permit motor cars to operate in Charlottetown city and royalty, on Monday, Wednesday and Thursday, each week. Four touring cars were immediately ordered as the result of the decision.

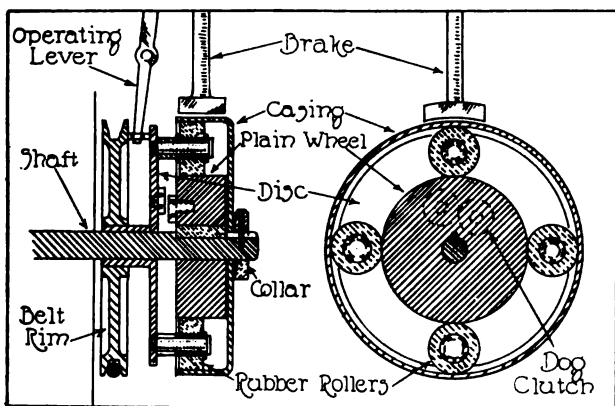


## THE REPAIR SHOP AND GARAGE.

### Suggestion for a Fan Attachment, Providing Two Speeds and Neutral, and Controlled from the Seat--Jig for Slotting Pinions--Hints and Tips.

**I**T IS customary to remove the fan belt in extreme cold weather and to replace it when needed, the change being made in accordance with the judgment of the operator. Many times the temperature will rise rapidly or fall suddenly in the winter, resulting in the motor overheating or becoming too cool to obtain maximum efficiency from the fuel. A suggestion for a two-speed fan appeared recently in *The Commercial Motor*, an English motoring print, which is reproduced, and although primarily intended for commercial cars, could be adapted to pleasure vehicles.

An accompanying sketch shows the device with the components lettered. It comprises, in addition to the details set forth, a connection from the lever member to the dash whereby the driver



An Epleycle Gear for Fan, Permitting Two Speeds as Well as a Neutral Position.

can utilize either of the two speeds or render the fan inoperative. The materials employed were obtained from the scrap heap with one exception, the rubber rollers.

The device comprises a casing of about 4.5 inches in diameter, which was constructed of a four-inch pipe having the threads turned off. This is free to revolve independently from the shaft. Inside of the casing is a perfectly plain wheel which is keyed to the shaft and is 2.5 inches in diameter, also four rubber rollers which are mounted on pins protruding from the disc member. The last named carries the pulley, from which power is transmitted to the fan, and is so mounted that it is free to turn and slide through a limited distance along the shaft.

The rubber rollers were made from three-gallon ammonia flask stoppers. These are of slightly greater diameter than the difference between the radii of the inside of the case and the wheel. In assembling it is necessary to force them into position and by this means they remain under compression, which prevents slipping. Small holes are burned or punched through the rollers, and brass tubing of suitable diameter and length is forced into position to act as bearings.

On the plate of the disc and on the side of the wheel are screws with the heads protruding, so that when the disc is shifted toward the casing the heads interfere, and the pulley wheel is driven at the same speed as the shaft. The shifting of the disc is accomplished by means of the lever which protrudes through the floorboard. Pressure on the brake member, which can be located in either an "in" or "out" position, causes the casing to come to a standstill, and the disc being moved toward the timing gear casing as far as possible, the pulley wheel is caused to revolve at approximately half the speed of the shaft. When the brake is released and the improvised dog clutch is disengaged, the casing revolves in the opposite direction to the shaft, due to the rollers remaining idle. This obtains the two speeds referred to. The rollers are the most delicate part of the device. When replacement becomes advisable, however, it is only necessary to loosen the collar member, which serves to retain the casing on the shaft.

### HARDENING SMALL DRILLS.

Hardening and tempering small taps and drills requires considerable care and experience if perfect work be obtained. When undertaking the work the drills or taps are held with the spiral or thread immersed in lead which has been brought to the melting point in an iron or earthenware crucible. Pieces of very small diameter should be left in the molten metal for about 60 seconds. They should then be withdrawn and plunged into cold water. If the bath be of the correct temperature no lead will adhere to the work when they are removed. After chilling the tools should be cleaned and tempered.

The most convenient method is to lay them on a sheet of old iron held over a charcoal and



gas fire. The tray should be rocked a little during the process in order that the pieces may be heated uniformly. When they attain a dark straw or gold color they should be again plunged in water. It is held that by the above treatment the degree of heat is strictly limited, and it is impossible to burn the edges as with an open fire.

#### SECURING BRASS PIPE IN VISE.

In replacing a broken brass pipe with new, and when threads have to be cut, the walls will be crushed unless one utilizes caution. A device for securing the work may be made by taking two pieces of wood and boring a hole in the line where they are joined together. The pipe is then placed between the jaws in the half-round holes and clamped tightly in the vise. A little powdered resin applied to the wooden members will prevent slipping.

#### GRINDING ALUMINUM.

Grinding aluminum castings on emery wheels spoils the latter as the soft metal clogs up the abrasive material, impairing its cutting efficiency. To avoid this, a piece of paraffine wax should be held against the wheel. It will not reduce the efficiency in any way and can be easily removed by the application of heat.

#### CASE HARDENING HINT.

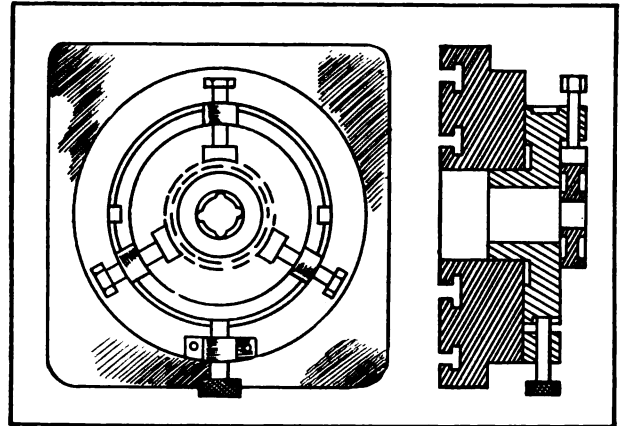
When case hardening a wheel or other component of a piece of work and it is desired to leave one section soft for machining, it can be accomplished by the following method: Before placing the work in the furnace to be carbonized, the part which it is desired shall remain soft, should be covered with a layer of old fire clay. When removing the part after the heating process, the fire clay should not be removed, but it should be allowed to remain in position until the work has become cool.

#### JIG FOR KEYWAY CUTTING.

A jig designed for holding gear pinions when cutting keyways, and which can be changed to cut one, two, three, four or any desired number of slots which may be required in the pinion, is shown in an accompanying illustration. An elevation view is presented at the right. The view at the left is of the T slotted base, which is bolted on the machine table of a slotting or keyway cutting machine.

The base is bored out in the centre, and a second jig is machined to drop into this bored-out section. The upper piece has three bosses cast onto it, through which set screws are taken serving to hold the pinion. Between the end of the set screws and the pinion, however, are three hardened steel pieces which are machined to the outside radius of the pinion which is being cut. Equidistant and tapered slots are cut in any required number around the holder, which has the cast lugs on it, and a spring controlled register pin runs through a boss cast on the main base. The pinion is held as shown by the dotted line. The spring controlled key drops into one of the slots and the keyway is cut, and any other slots may be brought into register for the purpose of cutting a second, third, fourth keyway, etc.

When this jig is made up, and suitable distance pieces have been made, it will be found a



A Gear Pinion Jig for Keyway Cutting Which May Be Utilized for Any Desired Number of Slots.

great convenience where a large number of pinions are continually being slotted, as the tool can quickly be adjusted to different sized wheels. The various distance pieces and blocks need not be made up at first. They will accumulate as different work is done, until a complete set is obtained.

A big conference of Velie dealers, representing all sections of the country, opened in a white city of 200 tents, each holding two men, at the plant of the Velie Motor Vehicle Company, Moline, Ill., July 21. Besides the tents for sleeping quarters there are two larger tents, one being utilized as a dining hall and the other for the convention proper. Prominent accessory manufacturers also were in attendance. The object of the conference was to acquaint the dealers with the features of the new Velie line, consisting of a light six and two four-cylinder models.



## FEATURES OF SMITH FOUR-JET CARBURETOR.

**A**N ENGLISH carburetor presenting interesting features in that four jets are incorporated, each having its own choke tube, is the Smith, the product of S. Smith & Son, London, England. Tests of the vaporizer fitted to pleasure and commercial vehicles resulted in fuel economy as well as motor efficiency.

As will be noted by reference to the sectional view presented at A in an accompanying illustration, the design makes for simplicity and accessibility of components. It is stated that a new set of jets may be fitted in two minutes. The first jet is of larger bore than the others and is utilized for starting, the second, third and fourth

minute, with a suction equal to a six-inch head of gasoline, this condition being automatically maintained on each jet when in operation, irrespective of the speed of the motor. The adjustment is effected by changing the jets until the correct mixture for all speeds is obtained. By means of a rotary sleeve valve operated by a lever, the driver can alter the mixture from the seat to suit varying atmospheric conditions. As will be noted, the float chamber is of conventional design. The variation in the sizes of the jets is due to the fact that as the speed and power of the engine increase, the strength of the mixture should decrease in a uniform manner. It is held that the Smith can be fitted easily to various makes of motors. There are six different connections for heating by hot water.

### COMING EVENTS.

#### August.

- Aug. 10—Track races, Pueblo, Tex.
- Aug. 12—Reliability run, Kansas State Automobile Association.
- Aug. 15-16—Track races, Denver, Col.
- Aug. 15—Hill climb, Tonale, Italy.
- Aug. 16—Track races, White Plains, N. Y.
- Aug. 18-22—Reliability run, Wisconsin State Automobile Association.
- Aug. 25-28—Reliability run, Houston, Tex.
- Aug. 29—Chicago Trophy race, Elgin, Ill.
- Aug. 30—Elgin Trophy race, Elgin, Ill.
- Aug. 30-Sept. 6—Reliability tour, Chicago, Ill.

#### September.

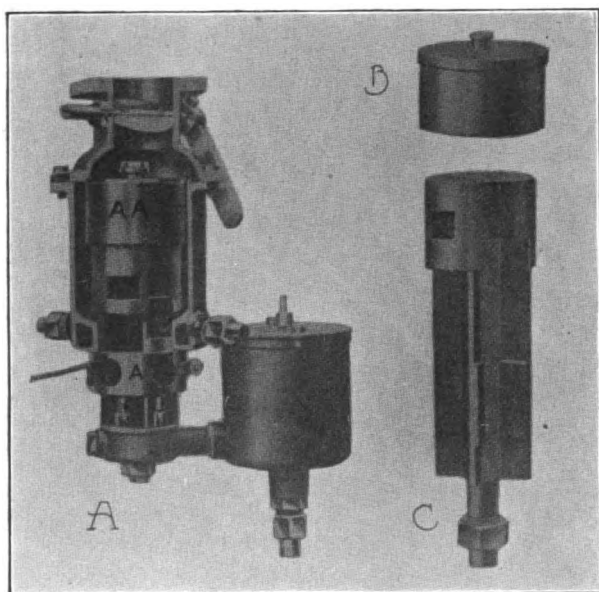
- Sept. 1—Fire chiefs' convention, Madison Square Garden, New York.
- Sept. 1—Track races, Columbus, O.
- Sept. 8-15—Around Lake Michigan tour, Chicago, Ill.
- Sept. 9—Speedway meet, Corona, Cal.
- Sept. 10—Track races, Cincinnati, O.
- Sept. 12—Track races, Canfield, O.
- Sept. 12—Track races, Youngstown, O.
- Sept. 13—Track races, Grand Rapids, Mich.
- Sept. 13—Track races, Covington, Ky.
- Sept. 20-21—Track races, Detroit, Mich.
- Sept. 26—Light car race, Boulogne, France.
- Sept. 28—Hill climb, Mount Verdun, France.
- Sept. 29-Oct. 4—American road congress, Detroit, Mich.

#### October.

- Oct. 15-25—Electrical show, Grand Central Palace, New York City.
- Oct. 17-27—Automobile Salon, Paris, France.

#### November.

- Nov. 4-5—Road race, El Paso, Tex.-Phoenix, Ariz.
- Nov. 4-5—Road race, Los Angeles, Cal.-Phoenix, Ariz.
- Nov. 4-5—Road race, San Diego, Cal.-Phoenix, Ariz.
- Nov. 6—Track races, Phoenix, Ariz.
- Nov. 24—Vanderbilt Cup Race, Savannah, Ga.
- Nov. 27—Grand Prize Race, Savannah, Ga.



**Smith Four-Jet Carburetor. Having an Automatic Controlling Valve: A, Sectional View; B and C, Choke Tube and Combination Piston and Sleeve Valve.**

being brought consecutively into operation, and automatically.

Centrally located in the main body of the device is the automatic controlling valve, which slides up and down, and as the surface is constantly washed by the moving mixture, it is kept free from foreign elements. It is stated that the float chamber may be fitted in eight different positions in relation to the throttle valve. Not only is the mixture automatically controlled by the valve member A A, but the latter rises in proportion to the speed of the engine and uncovers the ports of each succeeding choke tube, this bringing the jets into action.

Each jet is calibrated and stamped with the number of cubic centimeters of fuel passing a

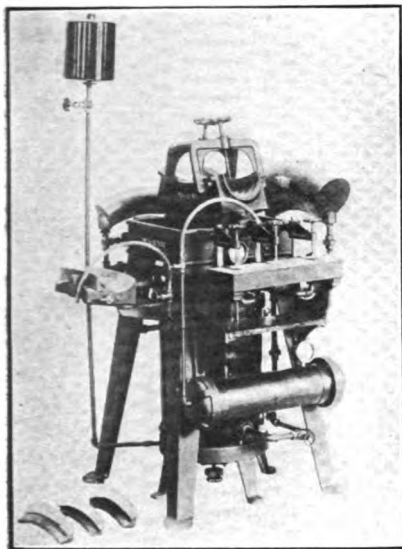
To stimulate a keener interest in touring in Nova Scotia, the Halifax Herald and the Evening Mail have donated a handsome trophy for a 500-mile motor car tour from Halifax to Yarmouth and return.



## GARAGE AND REPAIR SHOP EQUIPMENT.

**T**HE Brunner Manufacturing Company, Utica, N. Y., maker of Parker and other forms of air compressors, is producing what is termed the

No. 50 portable outfit, which is high grade in every particular and designed to meet every requirement of service in public or private garages. It is a complete unit, as will be noted by an accompanying illustration, and is easily operated, a socket being fitted to a convenient circuit.



**Hill-Stage Vulcanizer.**

The compressor has a capacity of one cubic foot of free air a minute, and the utilization of a safety valve permits of any desired pressure. The tank is of extra heavy steel, tested to 250 pounds, and is 30 inches long and 12 in diameter. Its capacity is 15 gallons (two cubic feet) and it is claimed that it will inflate two flat tires and harden up from eight to 12 according to their size. When the container is filled it will inflate one 36 by 4.5 casing to 90 pounds, also three to six ordinary sizes before it is necessary to start the motor.

The motor is an electric unit, .25 horsepower capacity, and is capable of starting the compressor against 120 pounds and increasing it to 150. Either alternating or direct current motors are supplied, and of any voltage and cycle. The gears are held to be noiseless through the use of a rawhide pinion and a cut cast iron spur. The truck carrying the equipment is substantially constructed, the forward axle revolving on a king bolt, no casters being used. The forward wheels are cast iron, eight inches in diameter, the rear members 10. Patented cushion tired wheels are furnished at a slight extra cost. Each outfit includes 12 feet of .1875-inch rubber tubing, one stop cock, a 2.5-inch polished brass gauge, a globe valve controller between compressor and tank, electric cord and a tire connection. The finish is

gloss black enamel. The fittings are polished brass and copper. The cost of operation is stated to be from one-quarter to two cents an hour.

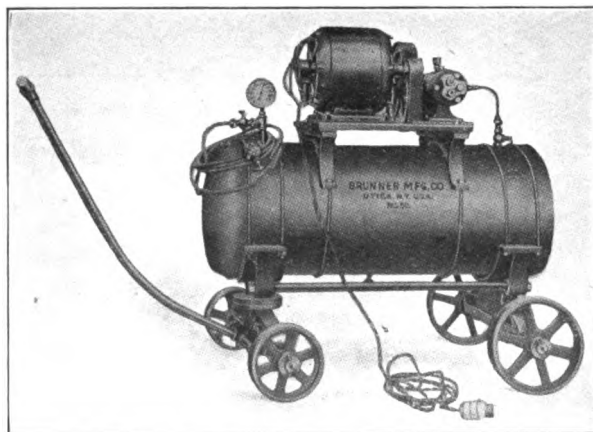
### HILL-STAGE VULCANIZER.

The Hill-Stage Company, Anderson, Ind., is marketing what is termed its No. 4 A outfit, which combines compactness and capacity, and it is moderately priced. The unit is wholly self-contained and has a jacketed boiler of large size equipped with either a gas or gasoline burner. It has a capacity of four casings, three tubes, one motorcycle and two bicycle tires at one heat. It is adapted for casings up to four inches, all sizes of tubes and any motorcycle tire.

The equipment includes one tread mold for casings, two inside molds, one large side mold, bead molds (both clincher and Dunlop), surface heating motorcycle molds and steam jacketed bicycle molds, also expansion tank for air. Either air bags or solid pads may be utilized, but the former are recommended. It is stated that but three sizes of air bags are necessary with the outfit. All machines are tested at the factory.

### BUFFALO AIR BRUSH.

The F. J. Leder Company, Buffalo, N. Y., is manufacturing the Buffalo air brush, which is a small automatic hand device designed for spraying or atomizing paint, oil, gasoline or similar substances. It is operated by compressed air and



**Brunner Portable Air Compressor Outfit Utilizing Electricity for Driving the Compressor.**

may be fitted with a flexible air hose if desired. The spray may be controlled as required. Special outfits are made for painting bodies, etc.



## IN THE REALM OF THE MOTORCYCLISTS.

**Dr. Patterson Re-Elected as F. A. M. Head--Dr. Thornley Replaced by Chicago Man on Competition Committee--Racing Results at Denver and Elsewhere.**

**N**INETY-THREE delegates to the national assembly of the Federation of American Motorcyclists in Denver held one of the most exciting conventions the organization has known, July 24-26. The attempt to create a new form of government failed, insofar as concerned the matter of legislating the office of president out of existence, but a return was made to the old method of district representation, although the form was changed materially in some respects. Perhaps the most interesting features of the convention were the re-election of President B. J. Patterson of Pratt, Kan., and the appointment of J. L. Donovan of Chicago to succeed Dr. J. P. Thornley of New York City as chairman of the competi-



**Samuel Koran, Providence, R. I., on Harley-Davidson.**

tion committee. The following official board was elected:

**President.**

Dr. B. J. Patterson, Pratt, Kan.

**Secretary-Treasurer.**

Dr. G. B. Gibson, Westboro, Mass.

**Directors at Large.**

Dr. B. J. Patterson, Pratt, Kan.

G. H. Hamilton, Milwaukee, Wis.

F. I. Willis, Indianapolis, Ind.

**District Directors.**

New England—E. M. Estabrook, Bangor, Me.

Atlantic—Dr. J. P. Thornley, New York City.

Southern—Howard A. French, Baltimore, Md.

Great Lakes—W. M. Johnson, Chicago, Ill.

North Central—C. W. Waughop, St. Louis, Mo.

South Central—D. P. T. Doenitz, Denver, Col.

North Pacific—J. F. Gorman, Seattle, Wash.

South Pacific—C. S. Pixley, Sacramento, Cal.

**Committee Chairmen.**

Competition—J. L. Donovan, Chicago, Ill.

Legal Action—O. F. McLain, Indianapolis, Ind.

Committee chairmen are appointed by the president with the approval of the board of directors, of which the president is chairman. No mention has been made of changes in the personnel of other committees, and it is presumed that they will remain in charge of the men who have conducted their affairs during the past year.

The proposal to abolish the office of president was first disposed of, after which Dr. Patterson was nominated to succeed himself. The opposition named Clarence S. Pixley of Sacramento, Cal. Just before the ballot was taken an effort was made to nominate O. F. McLain of Indianapolis, one of Dr. Patterson's chief supporters, but he refused to permit the use of his name. The result of the ballot was 51 votes for Patterson and 41 for Pixley. Dr. Gibson was re-elected for the 11th term as secretary without opposition. The office of treasurer was combined with that of secretary some three years ago.

The constitution was then amended to permit a return to the district form of government, increasing the number of directors from nine to 11 and providing for the election of territorial directors either by mail vote or in district convention. This portion of the rule will not go into effect until 1914, and in the meantime the geographical lines of the new districts will be decided upon.

### Race Results at Denver.

Some good racing was witnessed during the annual national meet in connection with the convention of the F. A. M. in Denver. Much of the interest centred in the outcome of the competition for the Bosch trophy in the national amateur events, but other races served to hold the attention of the crowd. The new M. M. A. cup was taken by W. Feuerstein of Norfolk, Va., on an Indian. Charles Balke, also on an Indian, was declared national professional champion. The results follow:

#### First Day, July 25.

One mile, national amateur championship—First, Constant, Indian; second, Feuerstein, Indian; third, R. Attaberry, Indian; time, 0:58.8.

Two miles, national amateur championship—First, Constant; second, Feuerstein; third, Attaberry; time, 1:57.4.

Five miles, national amateur championship—First, Constant; second, Feuerstein; third, Attaberry; time, 4:57.

Twenty-five miles, national amateur championship—First, Constant; second, Attaberry; third, Feuerstein; time, 25:14.





Merkel and Yale Agency Maintained by Marceau Bros., Pawtucket, R. I.

Five miles, open, professionals—First, Balke, Indian; second, Boyd, Indian; third, Goudy, Excelsior; time, 4:23.

Ten miles, national professional championship—First, Balke; second, Perry, Excelsior; third, Armstrong, Excelsior; time, 8:47.2.

#### Second Day, July 26.

One mile, national professional championship—First, Balke; second, Kenney, Excelsior; third, Boyd; time, 0:51.

Ten miles, national amateur championship—First, Constant; second, Feuerstein; third, Odiorn, Indian; time, 9:13.4.

Five miles, amateur for M. M. A. cup—First, Feuerstein; time, 5:11.8.

Ten miles, open, professionals—First, Perry, Excelsior; second, Balke; third, Armstrong; time, 8:46.4.

#### Third Day, July 27.

Five miles, amateurs—First, Knight, Indian; second, Hoblett, Indian; third, Odiorn; time, 4:56.

Five miles, professionals—First, Perry; second, Goudy; time, 4:16.

Ten miles, amateurs—First, Knight; second, Odiorn; third, Denberg, Indian; time, 10:14.6.

Ten miles, professionals—First, Perry; second, Goudy; time, 8:28.8.

#### Bosch Trophy Not Awarded.

The competition for the Bosch trophy, presented by the Bosch Magneto Company, New York City, was not completed at the Denver convention, it having been decided to postpone the running of the 50-mile event until the birthday celebration of the F. A. M., at the Empire City track, New York City, Sept. 5-7. This trophy is awarded annually according to a point system, and the standing of the contestants at the conclusion of the Denver meet was as follows:

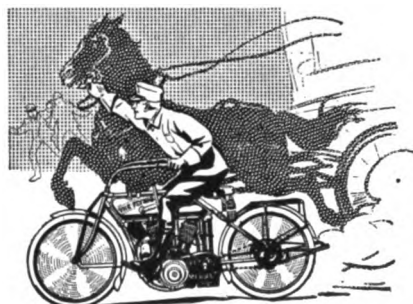
| Rider          | Miles | 1  | 2  | 5  | 10 | 25 | Total |
|----------------|-------|----|----|----|----|----|-------|
| J. U. Constant | 4     | 6  | 7  | 8  | 12 | 37 |       |
| W. Feuerstein  | 3     | 4  | 5  | 6  | 5  | 23 |       |
| R. Attaberry   | 2     | 2  | 3  | .. | 7  | 14 |       |
| Charles Odiorn | ..    | .. | .. | 4  | .. | 4  |       |

Constant hails from Brooklyn, N. Y.; Feuerstein from Norfolk, Va.; Attaberry from Pueblo, Col., and Odiorn from Denver. In the 50-mile event the possible points are: First, 15; second, 10; third, eight. Already there is much specula-

tion as to the final outcome of the competition. If for any reason Constant should be unable to start in New York City, Feuerstein might win out by a margin of one point. All four ride Indians. Constant now holds the trophy, having won it last year.

#### Sells Merkel and Yale.

An accompanying illustration presents the agency conducted by James A. and Frank A. Marceau as Marceau Bros., at 213 Lonsdale avenue, Pawtucket, R. I. The agency was established March 16, 1913, taking the local representation for the Flying Merkel, made by the Miami Cycle & Manufacturing Company, Middletown, O. So successful were the young men in interesting their friends in the merits of this product that shortly afterward they added the Yale, made by the Consolidated Manufacturing Company, Toledo, O. The two brothers are decidedly energetic and during this first season have found opportunity to arrange a number of events in which the riders in Pawtucket, Central Falls and surrounding towns have taken part with much interest. It is anticipated that with the opening of the 1914 season effort will be made to greatly extend the business, so that there shall be no delay in securing machines for early spring riding.



## ALWAYS READY FOR ANY EMERGENCY!

With its ability to pick up speed quickly—(60 miles an hour from a standing start within a city block)—the 1913 Flying Merkel Motorcycle is always ready for instantaneous use. These features and the fact that the Flying Merkel Motorcycle is the most economical in the world to operate has led to its universal adoption by Police Departments, Park Boards, Gas Companies, Telephone and Electric Light Companies and all other business concerns and individuals whose requirements demand a sturdy, reliable motorcycle at the minimum cost of upkeep. Remember, the Flying Merkel

"Made Its Name on Merkel Mileage."

Free Art Catalog on Request.

## The Miami Cycle & Mfg. Co.

320 Hanover St.

Middletown, Ohio, U. S. A.



### Accessory Makers at the Show.

President Coffman of the Motorcycle Manufacturers' Association, which is promoting the national motorcycle show in the Coliseum at Chicago, Nov. 3-8, has received a communication from Manager Sweet of the Motor & Accessories Manufacturers, announcing that the latter organization will sanction the display of products made by its members at this exhibition. The action is taken as a further indication of the success of the second show of this character to be held in this country.

### Manufacturers at Atlantic City.

The annual joint convention of the Motorcycle Manufacturers' Association, the Cycle Parts & Accessories Association and the Cycle Jobbers' Association, opened in Atlantic City, N. J., Aug. 5, with a social session. The next morning the three associations met separately to conduct busi-



**Bernard W. Whitehouse, Waltham, Mass., and His Indian.**

ness, and later took part in a golf match. July 7 there was a joint meeting, at which the following speakers were heard: L. D. Harden, Pope Manufacturing Company, "The Past and Future of the Bicycle"; A. J. Musselman, Allied Motors Corporation, "The Motorcycle"; C. L. Elyea, Elyea-Austell Company, "The Jobber"; Hon. D. S. Troxel, Troxel Manufacturing Company, "The Parts Makers"; J. Leo Sauer, New York City, "The F. A. M."

### Splitdorf Factory Branches.

The Splitdorf Electrical Company, Newark, N. J., maker of Splitdorf ignition devices, announces to the motorcycle trade the establishment of branch stations in all parts of the country, where supplies can be obtained and tests carried on under the direction of factory experts. New stations recently were established at Atlanta, Boston, Chicago, Detroit, Kansas City, Los

Angeles, Newark, New York City, Philadelphia, San Francisco, Seattle, Buenos Aires, London and other foreign ports. Other stations are being established as fast as arrangements can be made and it is the plan of the Splitdorf company to cover the country eventually from coast to coast.

### Jones Wins in a Merkel.

Judging by the large audience at the fair grounds at Dayton, O., July 21, motorcycle racing is in high favor in that city. The meet was held under the direction of the local club. Jones failed to break Baker's track record of 1:08, but considering the fact that the track was quite heavy fast time was made, Jones' Merkel mount only falling short by four seconds. Following are the summaries:

Three miles, amateurs—First, Lewis, Thor; second, Kinzig, Indian; time, 4:25.2.

Five miles, professionals—First, Evans, Indian; second, Gardner, Excelsior; third, Gandner, Indian; time, 6:19.8.

One mile, time trials—First, Jones, Merkel; time, 1:12.

Ten miles, professionals—First, Evans, Indian; second, Gardner, Excelsior; third, Jones, Merkel; time, 12:39.

Twenty-five miles, professionals—First, Jones, Merkel; second, Gardner, Excelsior; third, Gandner, Indian; time, 32:00.4.

### Races at Salt Lake City.

The races at Wandemere, Salt Lake City, Utah, are popular with the public and at a recent meet 3500 persons witnessed some excellent performances. In the last race all contestants finished abreast. The events run off were as follows:

Two miles, match, class A—First, Al Ward, Indian; second, J. A. McNeil, Excelsior; time, 1:31.2.

Three miles, class B—First, Burt Smalling, Merkel; second, R. E. Rognon, Indian; third, T. M. Samuelson, Indian; time, 2:16.

Three miles, match, class A—First, Al Ward, Indian; second, J. A. McNeil, Excelsior; time, 2:12.

Five miles, class B—First, T. M. Samuelson, Indian; second, Burt Smalling, Merkel; third, R. E. Rognon, Indian; time, 3:54.4.

Two miles, class A—First, Al Ward, Indian; second, J. A. McNeil, Excelsior; third, F. Whittier, Merkel; time, 1:23.

Six miles, open—First, Al Ward, Indian; second, Fred Whittier, Merkel; third, J. A. McNeil, Excelsior; time, 4:20.2.

### Yale as Clergyman's Assistant.

Rev. George W. Phillips of the First Baptist Church of Hamilton, O., finds the motorcycle useful in his work. He makes his pastoral calls on the members of his congregation with the assistance of a Yale machine, made by the Consolidated Manufacturing Company, Toledo, O., and is able to keep in close touch with those who live in the country districts. Rev. Mr. Phillips maintains that the motorcycle is the best medium for travelling that a minister in a small town can have. He has also used his machine to carry some of his medical friends on urgent sick calls.



### Merkel Takes Three Events.

Fast and exciting races were held at the track at Napoleon, O., July 21, a large gathering of spectators being aroused to great enthusiasm by the close finishes. Following are the summaries:

Two miles, amateurs—First, Gardner, Excelsior; second, Jahns, Harley-Davidson; third, Long, Merkel; time, 3:05.

Three miles, professionals—First, Weitzman, Merkel; second, Gauder, Excelsior; third, Huntsberry, Merkel; time, 3:58.4.

Five miles, amateurs—First, Long, Merkel; second, Gauder, Excelsior; third, Jahns, Harley-Davidson; time, 6:58.6.

Ten miles, professionals—First, Huntsberry, Merkel; second, Weitzman, Merkel; third, Bailey, Yale; time, 12:15.6.

### Motorcycle Tows Hudson Car.

With the prospect of making a sale, Edward Holofcener, Baltimore, Md., dealer in Yale motorcycles, made by the Consolidated Manufacturing Company, Toledo, O., performed a notable feat with one of his stock machines. Mr. Holofcener was told by a Baltimore citizen that if he could tow home his Hudson car, which had become stalled, he would purchase a Yale machine. Much to the surprise of the owner the motorcycle succeeded in pulling the big motor car with three people in it.

### Interested in Producing Handlebars.

After being engaged for many years in the business of manufacturing spokes and pedals, and for more than a year with the magneto industry, B. S. Keefer has become interested in handlebars, having acquired a substantial interest in the Chicago Handle Bar Company, Shelby, O. Mr. Keefer was treasurer and manager of the Standard Company, Torrington, Conn., for many years, and about a year ago became treasurer of the Splitdorf Electrical Company, Newark, N. J., maker of Splitdorf magnetos.

### Barkelow Succeeds Merkel.

Announcement is made by the Miami Cycle & Manufacturing Company, Middletown, O., maker of the Flying Merkel, that C. S. Barkelow has succeeded J. F. Merkel as mechanical engineer.

He will maintain headquarters at the new Indianapolis branch plant of the company, although, of course, some of his time will be spent at the main factory in Middletown. Machinery for the new Indianapolis building is being installed and it is expected that the work of manufacture will be under way before Aug. 15. The company states that its new models will be ready for delivery by Sept. 15.

### Club Notes, Here and There.

The Bay State Motorcycle Club of Boston, Mass., recently enjoyed a reliability run to Keene, N. H. Of the 14 who started, seven finished with perfect scores, despite some very bad roads en route.

The following members of the Harley-Davidson Motorcycle Club, Philadelphia, were given perfect scores in a road race held recently: John Seifert, John Brown, J. C. Wilde, Howard Kolp, George O'Malley, Alexander Klein, Walter Moon, Herman Harvey, William Mattner, G. Haitch.

The Indian Motorcycle Club, Cincinnati, O., will hold a series of motorcycle races at the Lantonia track, Labor Day. Three important events are to be arranged with suitable prizes, for amateurs and professionals.

The members of the Reading Motorcycle Club, Reading, Penn., held a recent meeting in front of their headquarters, 517 Penn street, which were destroyed by fire a short time before. The club hopes soon to secure temporary rooms for future meetings.

Thirty-six members of the Goshen Motorcycle Club, Goshen, Ind., recently made a run to Rome City, where they enjoyed bathing, boating and a fish and chicken dinner.

The Toronto Motorcycle Club, Toronto, Can., held its annual run to Rochester, N. Y., under conditions that were not the best. A heavy downpour of rain at the start deterred many, who had made preparations, from going, while others went by boat to Buffalo, N. Y., and joined the riders there. They were given a fine entertainment by the Rochester Motorcycle Club.



C. S. Barkelow, Mechanical Engineer, Miami Cycle and Manufacturing Company.

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which is the National Organization fostering the interests of motorcyclists along legislative and other lines. Cut this out, mail it, and you will get the reasons.

#### E. M. ESTABROOK

Chairman Membership Committee Federation  
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Please send me the F. A. M. Booklet and all information interesting to prospective members.

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| Lightweight Single, with Two-Speed Gear  | \$275 |
| Only Machine Built With Handle Bar Control of Clutch.  |       |
| Four-Cylinder  | \$300 |
| With Handle Bar Control of Clutch  | \$350 |
| Two-Speed Gear, Extra  | \$50  |
| Equipment includes two brakes, footrests if desired, compound spring fork, combined luggage carrier and stand. |       |

American F. N. Company, Boston, Mass.

Branch—415 Trumbull St., Hartford, Ct.



# NEWS OF THE MANUFACTURER AND DEALER.

The following concerns have been incorporated recently to manufacture or deal in motor cars, accessories, supplies, etc.:

**City Automobile Company**, Washington, Ind.; \$3000; G. H. Greenwood, L. G. Helphenstine, A. L. Kennedy.  
**Schlick Wheel & Tire Company**, Wheeling, W. Va.; \$150,000; A. Schlick, J. E. Morgan, D. H. Taylor, L. F. Gundling, R. Walter, Marshall Statler, O. A. Statler.  
**Bell Locomotive Works**, Yonkers, N. Y.; \$20,000; H. W. Bell, J. H. Bell, W. G. Bellows.  
**Haynes-Diefenderfer Company**, New York City; \$10,000; A. J. Diefenderfer, E. Hayes, L. W. Bennett.  
**Steinbock Engineering Company**, New York City; \$250,000; H. F. Steinbock, A. B. Gormully, F. C. Slevvers.  
**Standard Purchasing Company**, New York City; \$10,000; H. F. Dexter, M. H. Brooks, H. L. Cook.  
**City Auto Corporation**, Pulaski, Va.; \$10,000; S. M. Lyons, W. H. Wysor, R. L. Gardner.  
**LeCompte Cycle Car Corporation**, New York City; \$60,000; G. Goldmark, L. S. Higgins, H. R. Buckingham.  
**National Motor Truck & Manufacturing Company**,

manufacture tires; E. M. Trautman, F. A. Webb, C. Colsten.  
**Blue Hill Avenue Garage**, Boston, Mass.; \$10,000; F. H. Sidelinger, W. A. Clark, S. W. Culver.

**Grand Avenue Company**, Brooklyn, N. Y.; \$500; to manufacture motors; G. F. Mason, F. G. E. Strohsall, H. W. Bender.

**Chauncey S. Greene Company**, Boston, Mass.; \$20,000; A. A. Hoyt, B. S. Atwood, C. S. Greene.

**E. A. Laboratories**, Brooklyn, N. Y.; \$200,000; to manufacture accessories; E. Aufero, M. Aufero, D. Aufero.

**Moebius Wheel Company**, Boston, Mass.; \$100,000; A. F. McGettrick, G. B. Ryan, F. E. Peaslee.

**Wood Auto & Machine Company**, Carrollton, Ky.; \$10,000; E. A. Wood, J. P. Monnyhan, E. C. Smith, P. B. Gaines.

**Marathon Automobile Company**, Boston, Mass.; \$20,000; W. S. Killars, A. L. Schoolcraft.

## WITH THE MANUFACTURERS.

**The Lauth-Juergens Motor Car Company**, Fremont, O., maker of Lauth-Juergens trucks, has elected the following directors: J. Lauth and P. Lauth of Chicago; L. C. Worst, J. W. Worst, J. W. Forsyth, W. A. Lucas, L. W. Overmeyer and A. E. Culbert.

**W. F. Evans** of the McCue Company of Buffalo, N. Y., has made the announcement that Roger B. McMullen has been made general distributor of McCue wire wheels and axles, with headquarters at Chicago and Detroit.

**The Lozier Motor Company**, Detroit, maker of Lozier cars, believing that its business interests and patrons are better served by capable agents than by branch houses, has discontinued its branches in all the large cities, replacing them by well known and strong dealers. Harry S. Houghton, Inc., New York City; Albert W. Woodruff, Inc., Boston, and the Bigelow-Wiley Motor Car Company, Philadelphia, are concerns which have just been organized to handle Lozier machines. The Bird-Sykes Company, Chicago, has taken the Lozier interests in that city, while the Bekins-Speer Motor Car Company, Los Angeles, Cal., which has represented the Lozier in that city the past three years, has also taken over the San Francisco territory.

**The White Company**, Cleveland, O., maker of White pleasure and commercial vehicles, recently opened a new salesroom and service station at 216-218 North Broad street, Philadelphia. As is true of all the branch houses of the White company, provision is made to take care of every need of White users in the entire district served from Philadelphia. An accompanying illustration presents the new building.

**The Kissel Motor Car Company**, Hartford, Wis., announces the following agents for KisselKar trucks and pleasure vehicles: J. T. Gentry, San Bernardino, Cal.; Glenn A. Calkins, Riverside, Cal.; Fred Duvall, Pomona, Cal.; George Gilmore, El Centro, Cal.; Joseph S. Peoples, Petaluma, Cal.; Benjamin L. Brundage, Bakersfield, Cal.; P. J. Weisel & Co., Anaheim, Cal.; J. C. Phelan, Fresno, Cal.; Pacific KisselKar branch, Oakland, Cal.; West End Garage, Santa Ana, Cal.; E. B. Jones, Hornell, N. Y.; Empire garage, Middletown, N. Y.; Flato & Allen, Kingsville, Tex.; Oliver-Nussbaum-Scharf Company, Groesbeck, Tex.; W. S. Mattox, Greenville, Tex.; Lyscio & Walker, Joplin, Mo.; Nemic & Biscenius, St. Cloud, Minn.; J. W. Bush, Oakes, N. D.; New Island City Garage, Galveston, Tex.; Reno Nevada Company, Reno, Nev.; William Daly, Paterson, N. J.; Thomas Plimley, Victoria, B. C.; Kentucky KisselKar Sales Company, Lexington, Ky.; Waterloo KisselKar Company, Waterloo, Ia.; Douglass Motor Car Company, Douglass, Ariz.

**The Falls Cities Motor Company**, organized to take over the plant of the Ohio Falls Motor Company at New Albany, Ind., has been incorporated.

**The Whitney Manufacturing Company**, Hartford, Conn., has sold its 20-inch water tool grinder to the Taylor & Fenn Company, Hartford, and will now devote its entire attention to the manufacture of driving chains, keys and cutters for the Woodruff system of keying and hand-feed milling machines.

**The A. O. Smith Company**, Milwaukee, Wis., announces that because of the necessity for additional space for its frames and other pressed steel parts, the manufacture of the Smith multiple disc clutch will be



**New Salesroom and Service Station of the White Company in Philadelphia.**

Gibsonburg, O.; \$250,000; E. C. Russell, C. H. Hutchison, J. H. O'Leary, A. T. Crossett, F. E. Lamb, J. E. Weisel, N. W. Russell.

**John E. O'Neill**, Lawrence, Mass.; \$3000; automobiles; J. E. O'Neill, M. J. Ganley, E. J. Farley.

**Talking Horn Company**, Middletown, N. Y.; \$10,000; N. C. Oddo, T. H. Bingham, F. W. Morgan.

**Motor Machine Company**, Mobile, Ala.; \$10,000; W. D. Bellingrath, J. E. Lewis, G. W. Morse.

**Anthony Auto Repair Company**, New York City; \$10,000; J. Yandrasitch, F. M. Struckhausen, H. Struckhausen.

**Vacuum Tire Corporation**, New York City; \$50,000; W. J. Woodcock, C. G. Ross, F. L. B. Gartner.

**W. L. Auto Top Lifting Company**, Cincinnati, O.; \$10,000; W. Wirth, Oscar Lane, H. W. Fraser, G. M. Reswick, J. B. Clark.

**Ohio Buick Company**, Cleveland, O.; \$200,000; R. H. Lee, W. J. Patterson, G. R. Collar, G. M. Gallagher, E. M. Holmgren.

**C. & B. Garage**, Chicago; \$1000; A. E. Cosey, K. R. Ballentine, S. J. Matthews.

**John V. Wilson Company**, Boston, Mass.; \$20,000; E. T. Carr, J. V. Wilson, P. H. Skidmore.

**Trautman Corporation**, Brooklyn, N. Y.; \$1000; to man-



# Tarvia

*Preserves Roads  
Prevents Dust~*



Chestnut Street, Sewickley, Pa. Resurfaced with "Tarvia X."

## Sewickley's Experience with Tarvia

The Borough of Sewickley, Pa., has used "Tarvia A" as a surface treatment on its macadam roads for several years. Some of these were last treated in 1909 and all are still in excellent condition.

Chestnut Street has been resurfaced and other heavily-traveled thoroughfares have been constructed with "Tarvia X" as a binder. The local authorities report that they are "well pleased with the results."

In December, 1912, M. M. Baker, Borough Engineer, wrote:—

During the past few years the Borough of Sewickley has used "Tarvia X" and "Tarvia A" in the construction of new driveways on some of the most heavily traveled streets, and for re-sur-

facing of a number of streets situated in the residence section.

Both of these paving materials have stood the test well and we are glad to have the opportunity of expressing our satisfaction with the way in which they have "made good," and to recommend them for use in other municipalities where a first-class paving material is desired.

"Tarvia X" is a dense, viscid coal tar product which thoroughly binds and waterproofs the crushed-stone wearing course of modern roadways and pavements. "Tarvia A" is of lighter consistency for use in surfacing water-bound macadam roadways. "Tarvia B" is a dust layer and road preserver used cold on macadam roads already in use.

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transferred to the Universal Machinery Company of Milwaukee, which will hereafter make the clutch under the supervision of the Smith company.

**The Splitdorf Electrical Company of New York**, branch of the Splitdorf Electrical Company, Newark, N. J., maker of Splitdorf ignition devices, announces the opening of a factory branch at 210-212 North 13th street, Philadelphia, Penn., equipped to supply every form of Splitdorf product and to render an ignition service complete in every detail. C. C. Munson, a member of the Society of Automobile Engineers, is in charge of the branch.

**The Peerless Motor Car Company of New York**, factory branch of the Peerless Motor Car Company, Cleveland, O., maker of Peerless machines, has appointed Fred H. Cozzens manager of the motor truck sales department.

**The Henderson Motor Car Company**, Indianapolis, Ind., maker of Henderson cars, has appointed the following agents for its product: Henderson Motors Company, Toronto, Can.; Crossem & Searer, Joliet, Ill.; J. W. Grone-wold, Golden, Ill.; Lane Hardware Company, Robinson, Ill.; Jackson Motor Car Company, Nashville, Tenn.; Dunham & Long, Westboro, Mo.; American Sales Company, Louisville, Ky.; T. M. Bowler, Sheboygan, Wis.

#### GARAGE AND DEALER.

**The E. V. Stratton Company**, Albany, N. Y., as a result of its exceptional 1913 business in Hudson cars, made by the Hudson Motor Car Company, Detroit, has had its 1914 territory extended to include all of New York State west to and including Montgomery and Franklin counties, and south to part of Ulster and Dutchess; five counties in Vermont and three in Massachusetts, including the city of Springfield. John S. Harrington, formerly of Worcester and Boston, has been secured by the Stratton company to handle its Springfield district on Hudson cars and Stewart trucks.

**John A. Hamilton**, for many years in charge of the accessory department and buyer for Gibbes Machinery Company, Columbia, S. C., on Aug. 1, opened an accessory and supply business under his own name at 1216 Main street, Columbia. It is understood that the Gibbes Machinery Company will discontinue the accessory jobbing business and that Mr. Hamilton will succeed to that branch of its business.

**The Miles Standish Auto Company**, Oakland, Cal., will open a garage on 22nd street, Richmond, Cal.

**E. B. Stimson** has organized the Stimson Automobile Company at Minneapolis, Minn., and will handle the Wahl car, a new machine on the market.

**The Hilmer Shull Auto & Supply Company**, La Porte, Ia., is to erect a new garage.

**G. W. Stephens**, formerly with Carl Estabrook of Three Rivers, Okla., has opened a garage at Pawhuska, Okla.

**The State Automobile Company**, Detroit, has been formed to handle R-C-H cars, made by the R-C-H Corporation, Detroit, in northern Indiana and the lower peninsula of Michigan. Comprising the new firm are A. H. Collins and D. E. Wells, both men of wide experience and well known in the selling end of the industry.

**The Stocum-Bronson Automobile Company** has been organized at Oshkosh, Wis., to take over the garage of Philip W. Stocum, 43-45 Ceape street. The garage will be enlarged and much new equipment added. The principal owners of the concern are Mr. Stocum and Leslie K. Bronson.

**The Gauntlett Auto Sales Company**, Toledo, O., Buick distributor for northwestern Ohio and southern Michigan, has moved into the three-story building at 1014-1016 Madison avenue, formerly occupied by the Packard agent. E. D. Gauntlett is the head of the firm, which was formed at Toledo during the spring automobile show, since which time its territory has been materially increased.

**The W. S. Williams Auto Sales Company** has opened for business at Oshkosh, Wis. It has a three-story building at Otter and State streets.

**The D. K. S. Auto Supply Company**, Cape May, N. J., is building a new garage which is nearly completed. The company handles Ford cars, made by the Ford Motor Company, Detroit.

**Harry H. Keech**, Edmund A. Ringel and Clarence Salenstine have opened the Grove Street Garage at Milwaukee, Wis., the business being capitalized at \$5000. Mr. Keech formerly operated a garage on National avenue in that city.



## Round the World ON J. M. SHOCK ABSORBERS One More Instance of J. M. Efficiency!

From England and the Continent to the Holy Land, and through Egypt, Asia, India, China, Japan, Philippine Islands, Australia and South America to Panama and thence to San Francisco in time for the Panama Exposition in 1915—this is the stupendous route over which Edwin F. Kohl (of the University of Wisconsin) proposed a tour by motor car. Throughout the entire distance, roads of every description to the far corners of the earth, he will ride on **J. M. SHOCK ABSORBERS**.

Realizing that none but the best shock absorber should be intrusted with the important task of reducing jolting and vibration to a minimum, throughout such a long and arduous journey, many weeks were spent experimenting with various devices. The selection of **J. M. SHOCK ABSORBERS** was the result and the car equipped is now well started on its globe-encircling journey.

The same reasons—maximum efficiency and unrivaled durability—proven by actual experiment, induced A. J. Westgard, veteran pathfinder and pilot of the A. A. A. to equip his official car with **J. M. SHOCK ABSORBERS** for the transcontinental route-making work with which he is now engaged.

The same conclusions—arrived at by means of unique graphic experiments—caused Earle L. Ovington, the famous Boston aviator and mechanical expert, to endorse **J. M. SHOCK ABSORBERS** with his unqualified approval, after concluding the most remarkable series of vibration records ever attempted.

## Approved by Motorists the World Over

The fame of **J. M. SHOCK ABSORBERS** is not merely local—it is international. In every civilized country on the globe J. M. equipment is seen on the cars of experienced motorists, whether encountered on city boulevards or on mountain passes.

**Booklet "D" Contains Facts That You Should Know.** Gives the complete results of the noteworthy Ovington tests, illustrated by graphic diagrams made by the J. M. itself. Sent free, postpaid, on request.

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Think how often dry cells have failed you without warning; think how many you have had to use already this season.



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What do you say to a set of six Burn-Boston cells which ran a four cylinder, two cycle car 14,000 miles in fourteen months with an Atwater-Kent system and no other source of current? What about six Burn-Boston cells that ran a Klaxon horn for four seasons and into the fifth?

Doesn't this Burn-Boston service mean saving of money, time, worry, annoyance and insecurity? Aren't Burn-Bostons that do this sort of thing worth while to use, even at a higher first cost? You are buying a *cheap*—not an economical—source of current when you buy dry cells. A penny saved is a penny lost—if you buy dry cells.

But we cannot consistently sell you Burn-Boston Supercells unless you have been getting fair averages from dry cells as dry cells go. If you have not, it means that your wiring is bad, your current is getting a ground through faulty insulation, or your coil is old and needs renewing or adjusting, or you have been leaving your switch on while the engine is standing still—a process which takes about ten times the current drawn by a running engine. Under those conditions the Burn-Boston Supercell will last but little longer than the dry cell.

The Burn Boston is used by the War Department, the Navy Department, the New York Fire Department and those enlightened concerns all over the country which believe in true economy and absolute reliability.

Get Burn-Bostons of your dealer. If he cannot supply you, send us his name and we will see that you are supplied.

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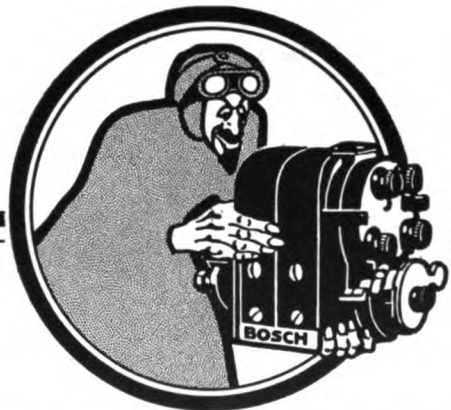
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Text written so that you can understand it. All having anything to do with the business wagon, whether owner, operator or repairman, should secure a copy of this discussion.

**PRICE, \$1.00 Postpaid**

## Motor Truck

**Times Building Pawtucket, R. I.**



## You Should Use the Leading System

**B**OSCH Magneto and Plugs were used by the winner of the Los Angeles Stockton Road Race. The Tacoma 600 cu. in. and Free-for-All Road Races also were Bosch victories—of course.

**Be Satisfied**

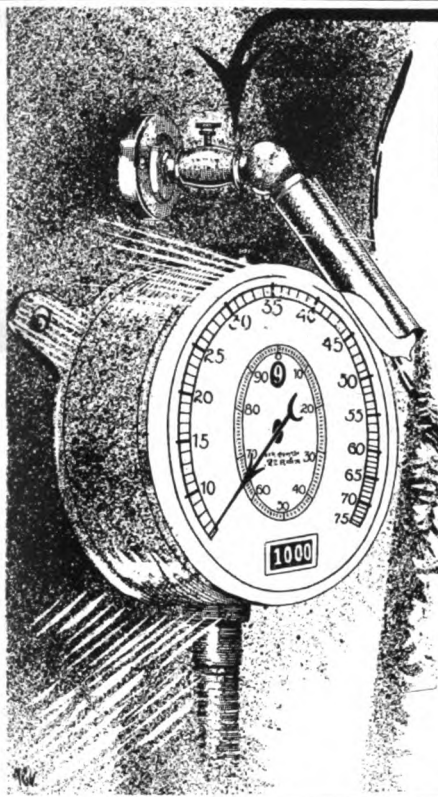
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**THE SWITCH MADE ON THE LIGHT**

The CELLO DASHLIGHT is the most powerful and economical light on the market. Its low price and upkeep cost make it a necessity for every car owner.

**READ YOUR SPEEDOMETER**

What's the use of having a speedometer unless you read it? Lighting matches is troublesome and dangerous. Send us \$1.50 to-day—if the light is not all we claim, we will refund gladly.

**If Your Dealer Has Not Got Them, Order Direct**

**A. S. CAMPBELL CO.**

**Atlantic Avenue - - - BOSTON, MASS.**



**RUBY  
All-Steel Garages**

An absolutely fireproof building, neat in appearance, with the strength of a skyscraper. Can be erected during your spare time. Small touring car size \$120. Other sizes in proportion. All of our buildings carry a fifteen year bank bond guarantee. Steel buildings for every purpose.

**KOLB SALES CO.**  
United States Rubber Bldg.  
NEW YORK

*For Perfect Control and Safe, Comfortable Driving use*

**Weed Anti-Skid Chains**

**At all Reputable Dealers  
Weed Chain Tire Grip Co., New York**

**Subscribe to  
THE AUTOMOBILE JOURNAL**



**Let Your Motor  
Do The Work**

**The Pump that took the "Shun" out of Inflation**

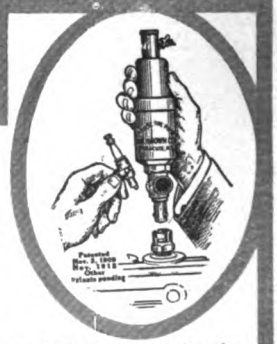
It's a **pleasure** to inflate your tires without sweating, fuming and straining.

It's an **economy** to get the exact pressure you need to make your tires give maximum service.

It's a **convenience** to attach and detach your pump without a wrench. A twist of the wrist and a few seconds of time to attach the pump, one to four minutes with your tire the right pressure. The gauge tells you when to stop.

motor at low speed to get **THE BROWN IMPULSE TIRE PUMP** for 1913 is the only tire pump that attaches and detaches without a wrench; the only one that includes hose, self-opening valve connection, high grade recording gauge and Quick Detachable Spark Plug as part of its regular equipment. Your 1913 equipment is not complete without it. It sells for \$15.00. Ask your dealer to-day. If he can't tell you all about it, send to us for descriptive literature.

**THE BROWN COMPANY, 222 Bellevue, Syracuse, New York.**



**When Writing to Advertisers, Please Mention The Automobile Journal.**

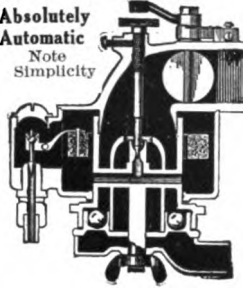


# 40 Gallons Less

With a Planhard

New York  
to Albany  
Race

Absolutely  
Automatic  
Note  
Simplicity



Eisner-  
Lenk Co.

1074 Boylston St.  
Boston, Mass.

Want Dealers in  
New England  
Cities to Handle  
Planhards

Planhard Mfg. Co.—My engine on Excelsior is a home-made 2 cycle 3 cylinder 4 1/4 x 5 inch. The very best I ever did with the S— carburetor was 380 R. P. M., and I am now making 625 under the same conditions with a Planhard. Two years ago in the New York to Albany race I used 105 gallons of gasoline in 27 hours 57 minutes. This year I only used a trifle over 65 gallons. I had to sell surplus gasoline at Edgewater for 18 cents that I paid 22 for in Albany, as I had no place to store it, so you see how it worked.

The race just completed was splendid, and I should have done better time had I followed the New York M. B. C. courses better, but I disobeyed its instructions and ran on a mud flat above Coxsackie. Coming back my timer broke when I was off Fishkill Landing and I limped home, making wooden plugs as fast as they wore away. However, with all delays the Planhard enabled me to beat my previous record 1 hour 45 minutes.

Thomas Trolsen.

## Best Croxton Could Find

The Planhard Mfg. Co. May 20, 1913.  
Gentlemen—We have decided to adopt the Planhard as "Croxton" carburetor equipment because we find it excels all others in economy, power, speed and most important of all in a pleasure car—flexibility. We determined to make the "Croxton" superior to any automobile in its class in every way, and only the best accessory of its kind, regardless of price enters into its makeup.

Realizing the importance of the carburetor as the most vital single factor in the operation of a car—especially now with the low and variable grades of gasoline commercially available, we determined that the "Croxton" should be the most modern, dependable and faultless, in this all important respect.

With this end in view, we laid out a series of heart-breaking tests for carburetors that would leave no doubt whatever as to the results of our decision. Your carburetor left all others at the post.

We congratulate you on your possession, and wish you every success.  
Very truly yours,  
THE CROXTON MOTOR CAR CO.,  
J. P. Stoits, President.

## 25 Miles to Gallon on Ford

Gentlemen—After taking the old carburetor off my Ford car and putting on a Planhard, I increased my mileage from 18 to 25 miles per gallon, and my engine, which was a notorious heater, runs as cool as desirable for the best results. I am using 60 to 62 gasoline, and as I have a hydrometer, I know what I am talking about.

A. W. Grandon.

# Planhard

The Ultimate Carburetor

Other Distributors

Southern N. J. & Eastern Penn., Gustave Muller, Jr., Bourse Bldg., Philadelphia.  
Hermann Engineering Company, Equitable Building, Detroit, Mich.  
Robt. H. Richter, 180 N-Market St., Chicago.  
J. G. Davis, 1224 Music St., New Orleans, La.

Planhard Mfg. Co., 1790 Broadway, N. Y.

Gentlemen:—Send at once your chart and book concerning Planhard Carburetor.

Name .....St. ....

City ..... State.....

Engine .....Carburetor....Size....in.

Threaded? Flanged? Horizontal? Vertical?

Pat. Europe.

Pat. America



Showing M&M Attached with 1/2" Elbow.

## Try the M&M Economizer For Speed, Power and Economy

HOW ABOUT THIS LETTER!

Moller Brothers, Philadelphia, Pa. Woodbury, Pa., April 1, 1913.  
Gentlemen:—I received the M&M and have already installed it on my Model C Schacht Car. I certainly find it O. K. It does all you claim for it and even more. I had considerable misfiring in one cylinder ever since I have had my car (which is 17 months), and since I have used the M&M the misfiring has all disappeared. It is certainly astonishing the difference it makes on the power and speed of the car. Also the beauty of coating down grades and saving fuel. I can highly recommend this device to anyone. I already have some prospective customers and will thank you to forward your agents proposition.

Thanking you kindly, I beg to remain,  
(Signed) H. G. MILLER, R. F. D. No. 1.

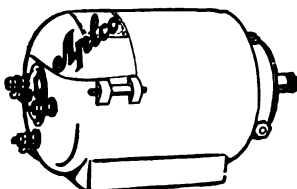
WHAT COULD BE MORE CONVINCING THAN THE ABOVE LETTER! ALSO, the M&M is guaranteed to do just what we claim, and if it proves unsatisfactory within thirty days, YOUR MONEY WILL BE REFUNDED. (Reference—Citizens National Bank, Lewistown, Pa.) The M&M is guaranteed to save from 40 to 50% of gasoline, and increase the speed and power 20% with less gasoline, and less carbon. It is the only known carburetor adjuster on the market, and RANKS FIRST AS A CARBON ELIMINATOR. For priming the motor, you cannot find its equal. PLEASE BEAR IN MIND—THERE IS NO SCREEN, or any other obstacle placed in the manifold, as this will have a tendency to CLOG THE MANIFOLD, and make it more difficult for the motor to absorb the gas and air.

PRICE OF THE M&M—\$3.50 and 17c extra for postage. We include either friction foot pedal, or steering post control, which consists of flexible shaft and wire. Requires 3/4" pipe tap, which can be reduced to 1/2" by means of an elbow or a common reducer.

PRICE OF THE MOTORCYCLE SIZE—\$1.25 Prepaid. Size 3/4".  
THE M&M ECONOMIZER IS "THE PATENTED ONE." Warning to users, makers and dealers, PATENT NO. 922,523—May 25, 1909.

WRITE US FOR FURTHER INFORMATION AND CATALOG.

Moller Brothers Controller & Economizer Company, Dept. A  
Main Office and Factory, Lewistown, Pa.



Bring your car up-to-date  
with the

APICO ELECTRIC  
LIGHTING SYSTEM

It can be done quickly and at little  
expense. Write us.

THE APICO ELECTRIC CO.  
74 Canal St., Dayton, Ohio

## THE "SIX-48" KEETON

REPRESENTS

The "finer points" of EUROPEAN DESIGN

\$3250 Completely Equipped

Interesting literature sent on request

KEETON MOTOR COMPANY

467 Lawton Ave.,

Detroit, Mich.

When Writing Advertisers, Please Mention The Automobile Journal.



# The "Black Eagle" Spark Plug

PATENTED

## 50 Cents Is Enough

The "Black Eagle" Spark Plug has made good because it was designed and manufactured with this result in view.

A person in close touch with the supply and manufacturing ends of the trade was a visitor at our factory recently, and was shown the details of construction, including the machinery, testing, and assembling of the "BLACK EAGLE" Spark Plug. What he said we believe will be of interest to you, as it indicates the effort on our part to supply a high grade plug at a reasonable price. We therefore quote below his impressions.

"I am simply amazed at the workmanship, material, and construction of the 'BLACK EAGLE' Spark Plug. When I saw this plug advertised at a price of 50c to the consumer, I naturally supposed it was a cheap, common, plug such as you occasionally find in jobbing houses on the bargain counter. I am convinced, after seeing these plugs tested, and examining minutely the machine parts which enter into their construction, that no better porcelain spark plug is offered by any one, regardless of the price they ask."



We are not influenced by what our competitors charge for spark plugs! We have ignored price precedent, for the reason that a high grade spark plug can be manufactured and sold at 50c each, and that is enough.

Sent prepaid on receipt of price. Made in all standard threads.

### THE STANDARD CO.

### Torrington, Conn., U. S. A.

#### MIGHTY MICHIGAN "40"

40-Horsepower Touring Car or Roadster, absolutely silent in operation. Oversize tires 36x4 1-2---cylinders 4 1-4x5 1-4 in.---118-in. wheel base---four-forward-speed transmission---dismountable rims---nickel mountings---massive, straight-line body---big, roomy seats---electric lighting by generator---everything. Price \$1585, includes full equipment. We also make a 33 H. P. model. Catalog on request.

(168) MICHIGAN MOTOR CAR CO., 185 Lay Blvd., Kalamazoo, Mich.



## National

FIVE MODELS STOCK CHAMPION \$2750 to \$3400  
Electric Starter Electric Lights  
National Motor Vehicle Co., Indianapolis

DON'T let rim rust destroy your tires;  
Paint them twice a season with

### THOMAS' ANTI RIM RUST PAINT

One dollar a can at your dealers, or write us

The Anti-Rust Paint Co., Dept. 7, Akron, Ohio

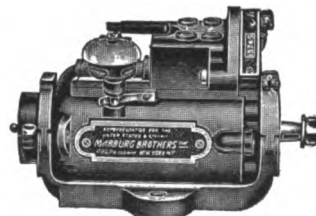
#### GYROSCOPE PRINCIPLE

The New Jones Speedometer Unaffected by Heat or Cold

Any motor car maker will equip with it if you state plainly you want nothing else, no matter what speedometer he may list in his catalog as equipment.

Write us for facts, test and experiments that show Jones supremacy beyond question.

THE JONES SPEEDOMETER—Broadway at 76th Street, NEW YORK



## Mea

Magneto

S. R. O. BALL BEARING

MARBURG BROS., Inc.,

Sole Importers  
Detroit. 1790 Broadway, New York. Chicago

## "THE WELDING" COMPANY

SPRINGFIELD BOSTON HARTFORD HOLYOKE  
BRIDGEPORT SALEM

All Parts of Any Metal Welded and Guaranteed  
ALUMINUM CASES AND CAST IRON CYLINDERS A SPECIALTY

### Subscribe to The Motor Truck

When Writing to Advertisers, Please Mention The Automobile Journal.



# Tire troubles?

You can't have any—with

## DAYTON AIRLESS TIRES

To Agents: Write us about territory for this practical sure-selling line of tires.

**Dayton Airless Tire Co.,**  
1878 Broadway, New York, N. Y.  
**Dayton Airless Tire Co.,**  
589 Boylston St., Boston, Mass.

**Dayton Rubber Mfg. Co.**  
1011 Kiser Street, Dayton, Ohio

**Dayton Airless Tire Co.,**  
80-84 West Mohawk St., Buffalo, N. Y.  
**Dayton Airless Tire Co.,**  
2123 Michigan Ave., Chicago, Ill.  
**Dayton Airless Tire Co.,** 332 N. Illinois St., Indianapolis, Ind.



The Thoroughbred Car.

Live wire dealers, write for unallotted territory.

**HERRESHOFF MOTOR COMPANY, Detroit, Mich.**

Electric self-cracking, electrically lighted.  
Four Forward Speeds.

"Six Thirty-Six" Touring  
Car and Roadster - \$1850  
Model 30 Touring Car - \$1350  
Model 30 Roadster - \$1250

EVERYTHING FOR THE AUTOMOBILE

**WAITE AUTO SUPPLY CO.**  
Manufacturers and Jobbers

81 Exchange Place Providence, R. I.

### STANWELD RIMS

Mechanically correct—easy to operate—perfect in material and workmanship. Used as standard equipment on the better cars.

**THE STANDARD WELDING COMPANY** Cleveland, Ohio

### CATARACT TIRE SERVICE

THE 10% OVERWEIGHT TIRES  
Guaranteed for 4000 Miles Service

Measured by Mileage, the Cheapest Shoes Ever Made.  
Clincher and Quick Detachable, Plain and Break-Skid Treads, Regular and Metric Sizes, for All Standard Rims.

**THE CATARACT RUBBER COMPANY**  
Boston, New York, Providence. Factory: WOOSTER, O.

## HECO- Magnetos

INSURE  
A STEADY SPARK  
AT ANY R.P.M.

HECO MAGNETOS are the product of experts specialized in the electrical business. They embody all that the electrical industry knows about magnetos.

By our special method of winding the secondaries we are able to positively guarantee them against burning out or breaking down.

HECO MAGNETOS supply a spark of equal intensity for any number of revolutions per minute.

We also make the well-known HECO COILS, and HECO COMBINATION PRIMERS and SPARK PLUGS. Let us send you our complete catalog.

**HEINZE ELECTRIC COMPANY**

Factories and Gen'l Office, Lowell, Mass.  
Sales Office, Detroit, Mich.

When Writing to Advertisers, Please Mention The Automobile Journal.

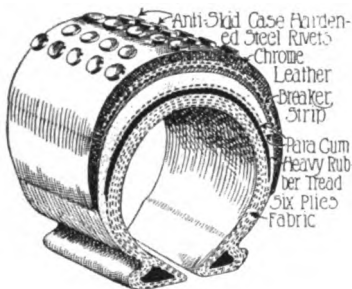


**TIRE PROBLEMS SOLVED**

BY THE

**INVINCIBLE NON-SKID TIRES****PUNCTURE AND BLOW-OUT PROOF****GUARANTEED FOR 3000 MILES**

By the INVINCIBLE process we rebuild completely your old, worn out casing, making it better than new. New Fabric and Rubber used throughout. The Chrome



Leather is solidly vulcanized to casing, eliminating heat or friction. The steel rivets endure during life of shoe, a feature found in no other tire. The cost is but four-fifths that of a plain tread shoe. We pay express charges both ways.

Write for our booklet on tire troubles and how the INVINCIBLE eliminates them. References furnished. We have hundreds of testimonials from users. Full value for your money as you deal direct with the maker.

**INVINCIBLE TIRE COMPANY**

53 SABIN STREET,

PROVIDENCE, R. I.

**SPLITDORF***"Always There"*

The SPLITDORF "T S" TRANSFORMER is interchangeable with any type tube or dash coil and can be attached to any car. We will make a very liberal allowance on an old coil in exchange for one of the new style.

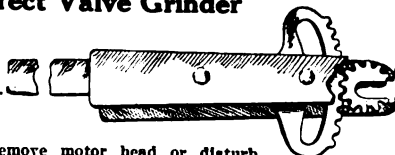
Write TODAY for particulars

**SPLITDORF ELECTRICAL CO.**

98 Warren Street, Newark, N. J.

**WILL GRIND FORD VALVES****Wall's Perfect Valve Grinder**

Patent Pending.  
Patents Allowed.



No need to remove motor head or disturb valve mechanism. A simple, practical tool, that works automatically and any one can operate it. Guaranteed, and will last for years. A new, simple and practical guide for owner, driver and repairer. Keep your valves in perfect condition. Cost of grinder saved first time used. For circulars and price list write

J. H. WALL, 290 Hope Street, BRISTOL, R. I.

**Thousands of Car Owners All Over the World Are Using Blue Ribbon Goods**

**BLUE RIBBON METAL POLISH** is the original "CREAM" Metal Polish and it still leads the procession.

**BLUE RIBBON NICKEL POLISH** is the result of 20 years' actual experience in manufacturing the finest gold and silver polishes. It is dangerous to use an experiment polish on fine nickel trimmings.

**BLUE RIBBON AUTO BODY GLOSS** revives and keeps the original factory finish and gloss on the body of the car—Shines like a mirror—No grease to catch dust—Leaves no coating.

**BLUE RIBBON RADIATOR LEAK-PROOF CEMENT** is a quick and permanent remedy for leaks. Does not clog the circulating system; prevents scale and rust; preserves the metal and increases the cooling capacity.

All **BLUE RIBBON** products strictly high class and fully guaranteed. **BLUE RIBBON** moves quick for the dealer—works fast for the consumer. Ask for sample, giving us name of Dealer or Jobber.

**INTERNATIONAL METAL POLISH COMPANY**

Quill and Naomi Streets,  
W. A. Blackburn, Eastern Distributor,

Indianapolis, Indiana  
335 Broadway, Moffat Building, New York City

**DIXON'S GRAPHITE CUP GREASE**

the Ideal Lubricant for Wheel Bearings, Being Permanent and Economical. Write for the Book "Lubricating the Motor," No. 210.

**JOSEPH DIXON CRUCIBLE CO.**

Jersey City

(4)

New Jersey

The Easiest Riding  
Car in the  
World

**MARMON**

Thoroughly expressive of the highest development of automobile design, materials and construction.

NEW SERIES MARMON "32" F. E. WING MOTOR CAR CO.  
\$2850 to \$4100 "Motor Mart"  
**THE MARMON SIX** 12 Columbus Ave., BOSTON  
\$5000 to \$6350 New England Dealers for  
**NORDYKE & MARMON CO., Indianapolis, Ind.**

**Pyrene**  
FIRE  
EXTINGUISHER

**FOR YOUR AUTO OR GARAGE**

The Pyrene Extinguisher is handsomely finished and may be carried in our special holder on the dashboard or any other convenient point of your car.

Write for Booklet

**PYRENE COMPANY OF NEW ENGLAND**

176 Federal Street, Boston, Mass.

**Jackson**  
No Hill Too Steep  
No Sand Too Deep

**OLYMPIC** - \$1500

4 cylinders

**MAJESTIC** - \$1975

4 cylinders

**SULTANIC** - \$2500

6 cylinders

**JACKSON AUTOMOBILE CO., 1203 East Main St.**

Jackson, Mich.

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# Classified Buyers' Guide

A Handy Reference for Purchasers

## ACCESSORY MANUFACTURERS AND JOBBERS.

**Auto Parts Co.**, Providence, R. I.  
**Hopewell Brothers**, Newton, Mass.  
 Branch: 1974 Broadway at 67th St., New York.  
**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.  
**Miller, Chas. E.**, 97-103 Reade St., New York.  
 Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Elghth Ave., and 2782 Broadway, New York; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 259 Peachtree St., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.  
**Milwaukee Auto Specialty Co.**, 128 Second St., Milwaukee, Wis.  
**Shaler Co.**, C. A., Waupun, Wis.  
**Waite Auto Supply Co.**, 81 Exchange place, Providence.

## ACETYLENE TANKS. (See Tanks.)

## ADJUSTERS.

**Vanstickle, John A.**, Indianapolis. (Ford Ideal Ball and Socket Joint.)

## AIR COMPRESSORS AND TANKS.

**Williams Foundry & Machine Co.**, Akron, O.

## AUTO LOCKS. (See Locks.)

## AUTOMOBILES. (See Cars.)

## AUTOMOBILE SPECIALTIES.

**Sumner, George, Inc.**, 1926 Broadway, New York.

## BALLS AND BALL BEARINGS.

**Boyd, F. Shirley**, 903 Boylston St., Boston. (R. I. V.)  
**Brets Co., J. S.**, 250 W. 54th St., New York. (F. & S.)  
**Marburg Bros., Inc.**, 1790 Broadway, New York. (S. R. O.)  
**New Departure Mfg. Co.**, Bristol, Conn. (New Departure.)  
**R. I. V. Co.**, 1771 Broadway, New York. (R. I. V.)

## BATTERIES.

**Burn-Boston Battery Co.**, 19 Doane St., Boston. (Burn-Boston.)  
**Electric Storage Battery Co.**, Philadelphia. (Exide.)  
**Geissler Bros. Storage Battery Co.**, 514 W. 57th St., New York.  
**Johns-Manville Co., H. W.**, Madison Ave. and 41st St., New York City. (J-M.)  
**Waite Auto Supply Co.**, 81 Exchange place, Providence. (Success.)  
**Willard Storage Battery Co.**, 5716 Euclid Ave., Cleveland. (LBA Lighting and Starting.)  
 Branches: 136 West 52nd St., New York; 1191 Woodward Ave., Detroit; 2241 Michigan Ave., Chicago; 243 Monadnock Bldg., San Francisco.

## BATTERY EXTINGUISHERS.

**Johns-Manville Co., H. W.**, Madison Ave. and 41st St., New York City.

## BLOW-OUT PATCHES. (See Patches.)

## BODIES, TRUCK.

**Motor Truck Body Co.**, 320 Franklin St., Detroit.  
 (Continued on Next Page.)

When Writing Advertisers, Please Mention The Automobile Journal.

# No more rattling troublesome oil lamps

Don't put up with bad smelling, dirty, rattling oil lamps. You can have a neat, efficient electric lighting system at moderate cost by equipping your car with

## J-M MOBILITE LAMPS

These Electric Lamps, which operate on Dry Batteries, consist of a vulcanized rubber socket fitted with a special Tungsten bulb, a powerful lens and reflector. Used for dash lights, tail lights, speedometer lights and interior car illumination. Also for motor boats, camps, etc.

They cost only one-third as much to operate as standard electrical equipment. Storage battery, magneto or low power dynamo may be used if desired. Any handy man can install them. Price, \$3.00 each, including necessary wire.

Order from our nearest branch if not at your dealer's.

Write for Booklet.

## H. W. JOHNS-MANVILLE CO.

|           |              |             |              |               |
|-----------|--------------|-------------|--------------|---------------|
| Albany    | Cincinnati   | Kansas City | New Orleans  | San Francisco |
| Baltimore | Cleveland    | Los Angeles | New York     | Seattle       |
| Boston    | Dallas       | Louisville  | Omaha        | St. Louis     |
| Buffalo   | Detroit      | Milwaukee   | Philadelphia | Syracuse      |
| Chicago   | Indianapolis | Minneapolis | Pittsburgh   | 2067          |

THE CANADIAN H. W. JOHNS-MANVILLE CO., LIMITED.  
 Toronto, Montreal, Winnipeg, Vancouver.

# KING MOTOR CARS

For Long Service at Low Upkeep

**\$1095 WITH EQUIPMENT**

Ward Leonard Starter and Generator \$100 extra.

30-35 H. P. Two Styles--Touring Car and Roadster.

**KING MOTOR CAR CO., Detroit. Show Room, New York.**

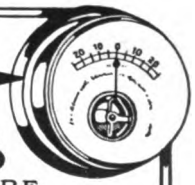
ALWAYS SPECIFY

**HOYT METERS**

AND GET YOUR MONEY'S WORTH

**HOYT ELECTRICAL WORKS**

INSTRUMENT  
 PENACOOK, NEW HAMPSHIRE



# THE MOTOR TRUCK

A National Motoring Magazine Devoted  
 Exclusively to the Commercial Field

**12 ISSUES**

**\$1.00 THE YEAR**



## (BUYERS' GUIDE—Continued.)

# PERFECT LUBRICATION RESULTS ONLY FROM THE USE OF PURE OILS

## HARRIS ARE TRADE MARK REG. U.S. PAT. OFF. OILS PURE OILS OILS

They are test free from impurities—  
from soot-producing carbon.

HARRIS OILS will keep your motor  
clean—will make it run smoothly—will  
reduce wear and cut down up-keep ex-  
pense. Therefore they are the cheap-  
est in the end.

They are made from  
the finest Pennsylvania  
Crude stock. 28 years  
experience stands back  
of HARRIS OILS.

"A Little Goes a Long Way  
and Every Drop Counts."

**A. W. Harris Oil Co.**

326 S. Water St., Providence, R. I.  
142 No. Wabash Ave., Chicago, Ill.



### BODIES—WOOD AND METAL.

**Springfield Metal Body Co.**, 20 Medford Ave., Spring-  
field, Mass.

### BRAKE BANDING OR LINING.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St.,  
New York City. (J-M Non-Burn.)  
**Royal Equipment Co.**, The, 422 Housatonic Ave.,  
Bridgeport, Conn. (Raybestos.)  
**Standard Woven Fabric Co.**, Worcester, Mass. (Multi-  
bestos.)  
**Branches:** 903 Boylston St., Boston; 276 Canal St.,  
New York; 720 Main St., Buffalo; 422 River St.,  
Troy, N. Y.; 1427 Vine St., Philadelphia; 1430 Mich-  
igan Blvd., Chicago; 1598 Woodward Ave., Detroit;  
St. Louis; San Francisco.

### BRAKES.

**Royal Equipment Co.**, The, 422 Housatonic Ave.,  
Bridgeport, Conn. (Duplex.)

### BRUSHES, WIRE.

**Williams Foundry & Machine Co.**, Akron, O.

### BUMPERS AND FENDERS.

**Sager Co.**, J. H., 271 South Ave., Rochester, N. Y.  
(Diamond.)

### CABLES. (See Wires.)

### CARBURETORS.

**Planhard Mfg. Co.**, 1790 Broadway, New York. (Plan-  
hard.)  
**Sumner, George, Inc.**, 1926 Broadway, New York. (S. U.)

### CARS—ELECTRIC PLEASURE.

**Anderson Electric Car Co.**, 458 Clay Ave., Detroit. (De-  
troit Electric.)  
**Baker Motor Vehicle Co.**, Cleveland. (Baker.)

### CARS—GASOLINE PLEASURE.

**Abbott Motor Co.**, 141 Waterloo St., Detroit. (Abbott-  
Detroit.)  
**Austin Automobile Co.**, Grand Rapids, Mich. (Austin.)  
**Cartercar Co.**, Pontiac, Mich. (Cartercar.)  
**Cole Motor Car Co.**, Indianapolis, Ind. (Cole.)  
**Empire Automobile Co.**, Indianapolis, Ind. (Empire,  
Little Aristocrat.)  
**Haynes Automobile Co.**, 166 Main St., Kokomo, Ind.  
(Haynes.)  
**Henderson Motor Car Co.**, Indianapolis. (Henderson.)  
**Herreshoff Motor Co.**, 620 Harper Ave., Detroit.  
(Herreshoff.)  
**Jackson Automobile Co.**, 1400 Main St., Jackson, Mich.  
(Jackson.)  
**Keeton Motor Car Co.**, Detroit (Keeton.)  
**Kissel Motor Car Co.**, 174 Kissel Ave., Hartford, Wis.  
(KisselKar.)  
**Knox Automobile Co.**, Springfield, Mass. (Knox.)  
**K-R-I-T Motor Car Co.**, Detroit. (K-R-I-T.)  
**Mercer Automobile Co.**, 1100 Whitehead Road, Trenton,  
N. J. (Mercer.)  
**Michigan Motor Car Co.**, 147 Lay St., Kalamazoo, Mich.  
(Michigan.)  
**National Motor Vehicle Co.**, 1033 22d St., Indianapolis.  
(National.)  
**Nordyke & Marmon Co.**, Indianapolis. (Marmon.)  
**Owen & Co.**, R. M., 19 W. 62d St., New York City. (Reo.)  
**Palce-Detroit Motor Car Co.**, Detroit. (Paige.)  
**Pierce-Arrow Motor Car Co.**, Buffalo, N. Y. (Pierce-  
Arrow.)  
**Reo Motor Car Co.**, Lansing, Mich. (Reo.)  
**Speedwell Motor Car Co.**, 80 Essex Ave., Dayton, O.  
(Speedwell.)  
**Studebaker Corporation**, Detroit. (Studebaker.)  
**Stutz Motor Car Co.**, Indianapolis. (Stutz.)

(Continued on Next Page.)

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 Branches: 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

**Willys-Overland Co., Toledo, O. (Overland.)**

**CARS—STEAM PLEASURE.**

**White Co., The, 828 E. 79th St., Cleveland. (White.)**  
 Branches: See Cars—Gasoline Pleasure.

**CARS—GASOLINE COMMERCIAL.**

**Adams Bros. Co., Findlay, O. (Adams.)**  
**Available Truck Co., 2334 Hamilton Ct., Chicago. (Available.)**  
**Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)**  
**Blair Mfg. Co., Newark, O. (Blair.)**  
**Brown Commercial Car Co., Peru, Ind. (Brown.)**  
**Cartercar Co., Pontiac, Mich. (Cartercar.)**  
**Clark, E. S., 242 Freeport St., Dorchester District, Boston. (Clark.)**  
**Driggs-Seabury Ordnance Corp., Sharon, Penn. (Vulcan.)**  
**Federal Motor Truck Co., Junction and Leavitt Sts., Detroit. (Federal.)**  
**Garford Co., Elyria, O. (Garford.)**  
**General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)**  
 Branches: New York, Chicago, Boston, Philadelphia, Kansas City.  
**Gramm-Bernstein Co., Lima, O. (B. A. Gramm's.)**  
**Knox Automobile Co., Springfield, Mass. (Knox.)**  
**Mais Motor Truck Co., Indianapolis. (Mais.)**  
**Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)**  
**Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)**  
**Reo Motor Car Co., Lansing, Mich. (Reo.)**  
**Sullivan Motor Car Co., 611 East Ave., Rochester, N. Y. (Sullivan.)**  
**Willys-Overland Co., Toledo, O. (Overland.)**

**CARS—ELECTRIC COMMERCIAL.**

**Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)**  
**Atlantic Vehicle Co., Factory, Newark, N. J.; 1600 Broadway, New York City; 10 Postoffice Sq., Boston. (Atlantic.)**  
**Baker Motor Vehicle Co., Cleveland. (Baker.)**  
**Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)**  
 Branches: 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.  
**General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)**  
 Branches: See Cars—Gasoline Commercial.  
**General Vehicle Co., Long Island City, N. Y. (G. V.)**

**CARS—FIRE, POLICE AND MUNICIPAL SERVICE.**

**Cartercar Co., Pontiac, Mich. (Cartercar.)**  
**Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)**  
 Branches: See Cars—Electric Commercial.  
**Knox Automobile Co., Springfield, Mass. (Knox.)**  
**White Co., The, 828 E. 79th St., Cleveland. (White.)**  
 Branches: See Cars—Gasoline Pleasure.  
**Willys-Overland Co., Toledo, O. (Overland.)**

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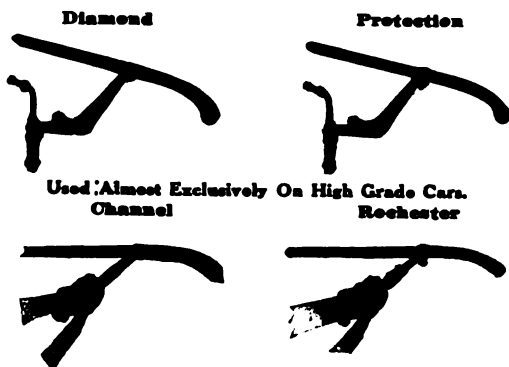
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Boyd, F. Shirley, 903 Boylston St., Boston. (Baldwin.)  
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Branches: See Accessory Manufacturers and Jobbers.)

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Chelsea Clock Co., 16 State St., Boston.

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Milwaukee Auto Specialty Co., 128 Second St., Milwaukee.

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Pyrene Co. of New England, 176 Federal St., Boston. (Pyrene.)

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Ross Gear & Tool Co., 794 Heath St., Lafayette, Ind. (Ross.)

#### GUNS, GREASE. (See Oil Pumps.)

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Sumner, George, Inc., 1926 Broadway, New York City. (Diva.)

#### HORNS.

Dean Electric Co., Elyria, O. (Tuto.)  
Randall-Falchney Co., Boston. (Jericho, Jubilee.)  
Branch: 918 Eighth Ave., New York.

(Continued on Next Page.)



(BUYERS' GUIDE—Continued.)

HOUSES, PORTABLE STEEL.

Koib Sales Co., 1790 Broadway, New York. (Ruby.)

INSULATION.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

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Hopewell Brothers, Newton, Mass. (Hopewell.)  
Branch: 1974 Broadway, New York.

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Apple Electric Co., Dayton, O. (Aplco.)  
Dean Electric Co., Elyria, O. (Dynalux.)  
Remy Electric Co., Anderson, Ind. (Remy.)

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Bracelet Auto Lock Co., 32 No. Clark St., Chicago.

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Borne, Scrymser Co., 80 South St., New York. (Colonial.)  
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Dixon Crucible Co., Jon., Jersey City, N. J. (Graphite.)  
Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagle-line No-Karbon.)  
Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)  
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Hawz, Geo. A., 142-144 Front St., New York. (Panhard.)  
Branch: 899 Boylston St., Boston.  
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Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Building, Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.  
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Miller, Chas. E., 97-103 Reade St., New York. (Pan-American.)  
Branches: See Accessory Manufacturers.  
New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)  
Standard Oil Co., New York. (Polarine.)  
Branches: In all cities.  
Texas Company, The, 7 West St., New York.  
Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.  
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Valvoline Oil Co., 27 State St., Boston. (Valvoline.)

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Branches: 119-121 E. 24th St., Chicago; 1250 Woodward Ave., Detroit; 357 Van Ness Ave., San Francisco.  
Brets Co., J. S., 250 W. 54th St., New York. (U. & H.)  
Heinze Electric Co., Lowell, Mass. (Heco.)  
Marburg Bros., 1790 Broadway, New York. (Mea.)  
Remy Electric Co., Anderson, Ind. (Remy.)

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**Miami Cycle & Manufacturing Co.**, 320 Hanover St., Middletown, O. (Flying Merkel.)

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**Rutenber Motor Co.**, Marion, Ind. (Rutenber.)

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**Remy Electric Co.**, Anderson, Ind. (Remy.)

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**National Motor Supply Co.**, 1911 Euclid Ave., Cleveland.

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Branch: 1974 Broadway, New York.

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Branches: See Horns.

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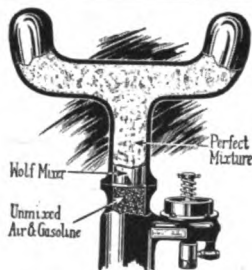
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Get more power and flexibility.  
Less noise, vibration and carbon deposits.  
No moving or delicate parts.  
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PRICE, size up to

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| Special Ford Type.....  | 1.00   |

State make and model of car. Sent postpaid on receipt of price. Sold on two weeks' trial.

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Three Great Models. Pilot 40, four-cylinders, 41-2x5. Brake test, 53 horse power. 120-in. wheel base. Price, \$2000. Pilot 50, four-cylinders, 41-2x6. Brake test 59 horse power. 126-in. wheel base. Price, \$2250. Pilot 60, six-cylinders, 4x6. Brake test 67 horse power. 122-in. wheel base. Price, \$2,500.

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### SPARK PLUG TERMINALS.

**Johns-Manville Co., H. W.,** Madison Ave. and 41st St., New York City.

**Randall-Falchney Co.,** Boston. (Mac-Kae Blitz.)  
Branches: See Horns.

### SPEEDERS.

**Interstate Auto Accessory Co.,** Indianapolis. (Ideal.)

### SPEEDOMETERS, RECORDERS, ETC.

**Hoffecker Co., The,** Motor Mart, Boston. (Hoffecker.)  
**Jones Speedometer,** New Rochelle, N. Y.

Branches: Broadway and 76th St., New York; 109 Massachusetts Ave., Boston; 1416 Vine St., Philadelphia; 1430 Michigan Ave., Chicago; 852 Main St., Buffalo; 253-255 Jefferson Ave., Detroit; 530 Golden Gate Ave., San Francisco; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

**Service Recorder Co.,** 2245 East 105th St., Cleveland. (Servia.)

**Stewart-Warner Speedometer Corp.,** Chicago. (Auto-Meter.)

Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330 1/2 North Illinois St., Indianapolis; 1613 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia; 5940 Kirkwood Ave., Pittsburg; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

### SPRINGS FOR AUTOMOBILE SUSPENSION.

**Marburg Bros., Inc.,** 1790 Broadway, New York. (Marburg-Hagen.)

**Perfection Spring Co.,** No. 1 Plant, 2414 Superior Ave., N. W.; No. 2 Plant, East 65th and Central Ave., Cleveland.

### SPROCKETS.

**Boyd, F. Shirley,** 903 Boylston St., Boston. (Baldwin.)

### STEEL PARTS, SEAMLESS.

**Standard Welding Co.,** Cleveland.

### STORAGE SYSTEMS—GASOLINE AND OIL.

**Seafie & Sons Co., Wm. B.,** Pittsburg, Penn.  
Branch: New York City.

### TANKS, ACETYLENE GAS.

**Prest-O-Lite Company,** 271 East South St., Indianapolis. (Prest-O-Lite.)

Branches: See Cylinder Cleaning Compound.

### TANKS FOR FUEL AND WATER.

**Seafie & Sons, Wm. B.,** Pittsburg, Penn.  
Branch: New York City.

### TANKS, TIRE INFLATING.

**Prest-O-Lite Co.,** 271 East South St., Indianapolis. (Baby Tire Filler, The Emancipator.)

Branches: See Cylinder Cleaning Compound.

### TOPS AND ATTACHMENTS.

**Springfield Metal Body Co.,** 20 Medford Ave., Springfield, Mass.

(Continued on Next Page.)



## (BUYERS' GUIDE—Continued.)

## TAPE—ASBESTOS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

## THERMOS CASES.

Dover Stamping & Mfg. Co., Cambridge, Mass.

## TIRE ACCESSORIES.

Firestone Tire & Rubber Co., Akron, O.  
Branches: See Rims—Removable and Detachable.  
Shaler Co., C. A., Waupun, Wis.

## TIRE CASES.

Hopewell Brothers, Newton, Mass. (Hopewell.)  
Branch: 1974 Broadway, New York.

## TIRE CHAIN GRIPS. (See Chains.)

## TIRE PRESERVATIVES AND PROTECTORS.

Approved Auto Specialties Co., 1731-37 Broadway, New York. (Goodman Tire Shield.)

## TIRES—CASINGS AND INNER TUBES.

Braender Rubber & Tire Co., Rutherford, N. J. (Braender.)  
Dayton Rubber Mfg. Co., Dayton, O. (Dayton Airless.)  
Diamond Rubber Co., Akron, O. (Diamond.)  
Firestone Tire & Rubber Co., Akron, O. (Firestone.)  
Branches: See Rims—Removable and Detachable.  
Fisk Rubber Co., Chicopee Falls, Mass. (Fisk.)  
Branches: 811-813 Boylston St., Boston; 17½ Dorchester St., Providence.  
Gaulois Tire Co., 1926 Broadway, New York. (Gaulois.)  
Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-Rim-Cut.)  
Branches: In all principal cities.  
United States Tire Co., Broadway and 58th St., New York. (Continental, G & J, Hartford, Morgan & Wright.)  
Branches: See Rims—Removable and Detachable.  
Walpole Tire & Rubber Co., Walpole, Mass. (Walpole.)

## TIRES—CUSHION.

Cataract Rubber Co., Wooster, O. (Cataract.)  
Branches: Boston, New York, Providence.  
Firestone Tire & Rubber Co., Akron, O. (Firestone.)  
Branches: See Rims—Removable and Detachable.  
Motz Tire & Rubber Co., The, Akron, O. (Electric Special Motz Cushion.)  
Branches: Boston, New York, Philadelphia, Pittsburgh, Chicago, Kansas City, Detroit, Cleveland, Los Angeles.

## TIRES—MOTORCYCLE.

United States Tire Co., Broadway and 58th St., New York. (Morgan & Wright, G & J.)  
Branches: See Rims—Removable and Detachable.

## TIRES—SOLID AND COMMERCIAL.

Diamond Rubber Co., Akron, O. (Diamond.)  
Firestone Tire & Rubber Co., Akron, O.  
Branches: See Rims—Removable and Detachable.  
Fisk Rubber Co., Chicopee Falls, Mass.  
Branches: See Tires—Casings and Inner Tubes.  
Motz Tire & Rubber Co., The, Akron, O. (Motz.)  
Branches: See Tires—Cushion.  
Polack Tire and Rubber Co., 246 W. 59th St., New York City. (Polack.)  
Republic Rubber Co., Youngstown, O. (Republic.)  
United States Tire Co., Broadway and 58th St., New York.  
Branches: See Rims—Removable and Detachable.  
Spiltdorf Electrical Co., 98 Warren St., Newark, N. J.  
Branches: See Magnetos and Magneto Supplies.

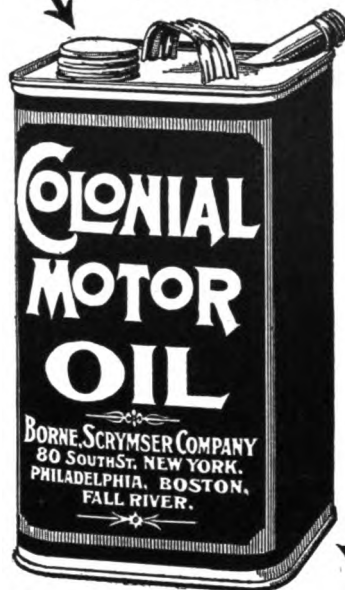
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When Writing to Advertisers, Please Mention The Automobile Journal.

## Burn Up the Miles

(Not the Oil)

A perfect lubricant means more miles per gallon without smoke and carbon.



Use COLONIAL and NOTE the DIFFERENCE

## COLO GREASE

*A real transmission grease*  
Will make your gears run smoothly and quietly because it is made especially for gear lubrication.

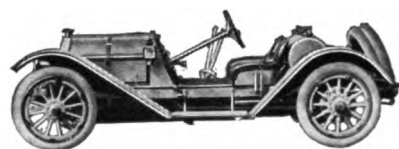
## COLONIAL Timing Gear Oil

overcomes all trouble with your timing gear. Use it and NOTE the DIFFERENCE.

## SILEX GREASE

*The greasiest grease made*  
The real test of a grease is not its looks or the feeling but its lubricating properties. SILEX is made to lubricate and last.

Type 35  
Series J  
Races about  
Guaranteed  
Speed—Mile in  
51 Seconds



## MERCER

The Mercer's speed and endurance record at Indianapolis and other important contests is a valuable asset from the dealer's viewpoint.

*Some desirable territory open. Write today.*

MERCER AUTOMOBILE CO., 1100 Whithead Road  
TRENTON, N. J.

## BRAENDER TIRES &amp; TUBES

Are of the highest quality and the cheapest on mileage. They are built to last. Send for price list and particulars.

BRAENDER RUBBER & TIRE CO.

Main Office and Factory RUTHERFORD, N. J.

## VALVOLINE OIL CO.

Heavy, Medium and Light

## Automobile Oils

27 STATE STREET, BOSTON, MASS.



## (BUYERS' GUIDE—Concluded.)

## TROUBLE FINDERS.

**Hopewell Brothers**, Newton, Mass. (Vibrator.)  
Branch: 1974 Broadway, New York.

**TRUCKS AND TRACTORS**—(See Cars, Commercial.)

## TRUNK RACKS.

**Connecticut Steel & Wire Co.**, Hartford, Conn.

## TUBING, GAS.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St.  
New York City.

## TURNTABLES.

**Beach Co.**, T. C., 108 Ottawa St., St. Johns, Mich.  
(Beach.)

## UNIVERSAL JOINTS.

**Bretz Co.**, J. S., 520 W. 54th St., New York. (Hartford.)

## VALVE GRINDERS.

**Wall, J. H.**, 290 Hope St., Bristol, R. I. (Ford.)

## VULCANIZERS.

**National Motor Supply Co.**, 1911 Euclid Ave., Cleveland.  
(Garage and Individual.)

Branches: In all principal cities.  
**Shaler Co.**, C. A., Waupun, Wis. (Shaler.)  
**Vanderpool Co.**, Springfield, O.  
**Williams Foundry & Machine Co.**, Akron, O.

## WELDING, AUTOGENOUS.

**Autogenous Welding Equipment Co.**, Springfield, Mass.

## WELDING OUTFITS.

**Prest-O-Lite Co.**, 309 W. South St., Indianapolis.  
(Prest-O-Welder.)  
Branches: See Cylinder Cleaning Compound.

## WELDING STEEL.

**Standard Welding Co.**, Cleveland.

## WHEELS.

**McCue Co.**, The, Buffalo, N. Y. (Wire.)

## WIRES AND CABLES.

**Diamond Rubber Co.**, Akron, O. (Diamond.)

## WIRE MECHANISM.

**Bretz Co.**, J. S., 250 W. 54th St., New York. (Bowden.)

## WRENCHES AND COMBINATION OUTFITS.

**Allen Wrench and Tool Co.**, Providence, R. I. (Allen  
Friction Socket Sets.)  
**Coes Wrench Co.**, Worcester, Mass.  
**Cutter, George A.**, Taunton, Mass.  
**Walworth Manufacturing Co.**, Boston. (Stillson.)



"THE OIL THAT SUITS  
AND DOES NOT SOOT"

## EAGLEINE NO KARBON Cylinder Oil

—Registered—

C that K

is guaranteed not to carbonize.

Which will YOU buy?

Oil on a guess or Oil on a guarantee?

SEE ADDRESS IN THE CIRCLE ABOVE

"PASS THEM ALL"



Send for Pleasure or Commercial Catalogue.  
KNOX AUTOMOBILE CO., SPRINGFIELD, MASS.

### F. SHIRLEY BOYD

903 Boylston St.

Boston, Mass.

Dorian Demountable Rims.

Supplementary Spiral Springs.

R. I. V. Ball Bearings.

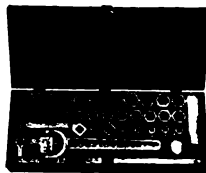
## CAMERON CARS \$975

All Up-To-Date Features

Four cylinder, water cooled, 30 H. P. Four forward speeds.  
112 in. wheelbase. Left hand drive, centre control. Starts from  
seat. Pointed hood, beautiful lines and finish. Equipment  
unsurpassed at the price.

Write for full details and terms to agents

THE CAMERON MANUFACTURING CO. Beverly, Mass.



Bay State Autokit, No. 1, \$10

Bay State Autokit, No. 2, \$7.50

Bay State Stickit, \$3

**GEO. A. CUTTER**, Sales Agent  
Taunton, Mass.

When Writing Advertisers, Please Mention The Automobile Journal.



**Confidence in Your Brakes—  
The Knowledge That They Will  
Grip and Hold—That's What You  
Must Have in Motoring!**

**TRADE MARK**  
*Raybestos*  
**REG. U.S. PAT. OFF.**

**"THE ORIGINAL AND BEST ASBESTOS BRAKE LINING"**  
*Makes Brakes Make Good*

Raybestos Lined Brakes Stop the Car at once. They protect you from accident—they will not fail in a crisis.

Raybestos is the Standard Brake Lining of the Industry. It is made of genuine long fibre asbestos specially woven and treated. Insist upon getting Raybestos. The name is stamped on every foot for your protection. Comes in all widths. Easily attached. Ask your dealer.

---

**The Royal Equipment Company**

Railroad and Bostwick Aves.

BRIDGEPORT - - - - - CONN.

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*We also make Duplex and Raymond  
Brakes and Gyrex, the Mixer*





# MILLER'S BIG ANNUAL CATALOG

**1913 Edition  
Now Ready**

Every Year This Is The Most  
Important Event of  
the Season



Reduced cut of the handsome three color cover of Miller's 1913 Catalog.

All the material illustrated in our 1913 Annual Catalog will be delivered free to any part of the United States, in accordance with the schedule listed on pages 4 and 5 of this catalog.

Don't fail to write today for a free copy of this wonderful book and keep it on file throughout the year. It is the most complete and valuable encyclopedia of the automobile supply market published. Each year it has grown in size and completeness. For 1913 it is greater than ever and the circulation has increased accordingly.

Chas. E. Miller's Annual Catalog has come to be universally recognized as the standard dictionary of the American automobile accessory and supply industry. It is more than a business aid. It is a reference work which is used by thousands for this purpose every day in the year.

## NEW ENGLAND BRANCHES:

202-204 Columbus Ave.,  
Boston, Mass.

274 Trumbull Street,  
Hartford, Conn.

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Prices the same at the above branches as in New York City.

Send your name and address *now* with 5 cents postage (to cover cost of mailing) for a free copy of this valuable book.

**CHAS. E. MILLER,** Manufacturer, Jobber, Exporter and Importer, **97-99-101-103 Reade St., New York City**

ESTABLISHED 1896



VOL. XXXVI.

NO. 2.

# AUTOMOBILE *JOURNAL*

*\$1.00 the year*  
*10 cents the Copy*

PAWTUCKET R.I.

August 25, 1913

## HAVOLINE OIL



**For Perfect  
Lubrication of  
Automobile**

**And Marine  
Gasoline Engines**

This OIL is NOT AN EXPERIMENT, here today and gone tomorrow, but has for many years maintained the highest reputation as a scientifically prepared lubricant which is properly filtered, so that it burns clean, without leaving carbon deposits on plugs or cylinders.

The biggest engine manufacturers in the East and in the West recommend it; thousands use it on Touring and Racing Automobiles, and Working, Cruising and Racing Motor Boats, and all are pleased to find that

*“It Makes a Difference”*

**INDIAN REFINING COMPANY, Inc.**

17 Battery Place

NEW YORK CITY





# COES

## THE Wrench Supreme

Strength without bulk or clumsiness.

Ease of handling without slipping or bruising.

Perfect balance and right grip

Everything the motorist desires in a wrench is to be found in the "COES" AUTOMOBILE MODEL, and you will never know perfect wrench service until you pin your faith to it.

It stands to reason that the 5 per cent. more you pay for a "COES" wrench goes for 60 per cent. more quality and service—put this wrench in the tool kit and shop. You will get your money's worth.

Send for Literature Now.

---

### Coes Wrench Co.

WORCESTER, MASS.

J. C. McCARTY & CO.,  
21 Murray St., New York City  
JOHN H. GRAHAM & CO.,  
113 Chambers St., New York City

When Writing to Advertisers, Please Mention The Automobile Journal.

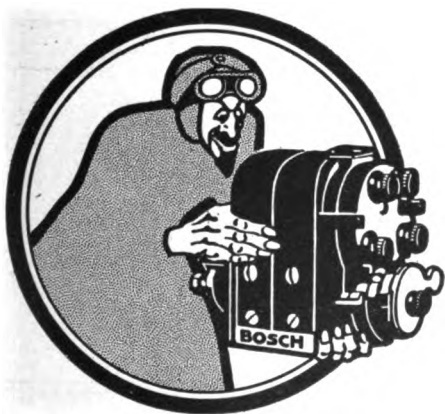


# This Makes Your Car a Success

A good engine properly supported by a Perfect Ignition System—a high-class, dependable and efficient Magneto, the right kind of Spark Plugs and the highest grade of cable.

## Specifying Bosch

gives you all that and besides you have evident ease in knowing that all your trips and tours will be unmarred by puzzling ignition troubles.



**Be Satisfied  
Specify Bosch**

*Literature Sent on Request*

**Bosch Magneto Co.**

204 West 46th Street, New York

Maine Motor Car Co., Portland, Me.—Motor Parts Co.,  
Boston—N. E. Distributors.



# HAYNES

## First of the Old Line Cars to Adopt the Vulcan Electric Gear Shift

Ever since Elwood Haynes created America's first gasoline car and drove it down the streets of Kokomo, two decades ago, the Haynes has been a pioneer, a pace-maker in developing the Automobile, and adding new improvements. At the top of the next page is a long list showing that the Haynes has been first to use a majority of the important improvements. And now the Haynes again comes to the front,

### SCORING ANOTHER BIG FIRST

The new Haynes models, are first for up-to-date equipment. They have absolutely everything that makes a car easy to start, control and ride in. The Haynes reputation is of the best. Haynes reliability and economy are common talk with the trade.

They have complete electric equipment; electric starter, electric lights, electric gear shift.

The cowl-board conveniences include switch for electric lights, oil sight feed, ignition, automatic cut-out for lights, dash light, auxiliary air-pressure pump, air gauge and speedometer.

Regular equipment includes mechanically operated tire pump. The gasoline supply is automatic pressure-feed.

The gasoline capacity is larger than the average.

The design is new. The lines are longer and more sweeping. It's a grand car through and through.

Read the specifications, see what great cars we have for you in the new models and remember that same sturdy reliability is put into these cars as has been built into the Haynes for twenty years.

#### Specifications of the New Haynes

**Motor**—Bore 4 1-4 in., Stroke 5 1-2 in. L-head Haynes. Cylinders cast in pairs.

**Cooling**—Centrifugal pump and pressed steel fan.

**Wheel Base**—Model 26, 130. Model 27, 136. Model 28, 118.

**Ignition**—American Simms Magneto.

**Lubrication**—Splash and gravity feed.

**Control**—Left hand. Vulcan Electric Gear Shift.

**Transmission**—Selected Type, three speeds forward, one reverse.

**Steering Column**—Worm and worm gear type.

**Clutch**—Haynes contracting steel band.

**Rear Axle**—Full Floating Timken on Models 26 and 27; McCue, Model 28, Gourney Bearings.

**Front Axle**—I-Beam. O. H. steel heat treated.

**Wheels**—Artillery type. Funk demountable rims.

**Tires**—Models 26 and 27, 36x4 1-2. Model 28, 34x4.

**Springs**—Front Semi-elliptic 39 1-8x2, rear 48x2.

**Brakes**—15 1-4 external and 15 internal on Models 26 and 27. 12 and 16 internal on Model 28.

**Finish**—Indiana dark blue body. Pacific Tour gray, optional.

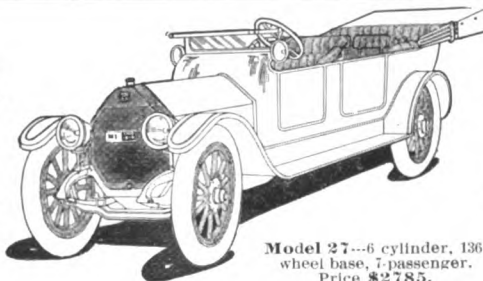
**Gasoline Feed**—Pressure. Automatic feed.

**Upholstery**—Buffed leather—deep cushions.

**Starting and Lighting**—Leece-Neville electrical system.

**Dash Equipment**—Electric lights, sight oil feed, automatic cut-out for generator, dash light, auxiliary air pressure pump, air gauge and speedometer. Models 26 and 27 have rim wind clock and shock absorbers.

**Other Standard Equipment**—Top, top cover of silk mohair, mechanical tire pump, rain vision ventilating wind-shield, Vulcan electric gear shift, two large electric headlights, electric side lights, electric tail light, full dash equipment, electric starter, generator, 80 ampere hour storage battery, speedometer, horn, coat and foot rails, tire irons, full tool equipment, one extra demountable rim and Collins curtains.



Model 27—6 cylinder, 136-wheel base, 7-passenger. Price \$2785.





## Other Haynes Firsts

The first gasoline driven American-made car.  
 The first two-cylinder opposed motor car.  
 The first user of aluminum in crank case.  
 The first to use nickel steel in the axles.  
 The first side door car.  
 The first to use throttling carburetor.

The first to use make and break spark.  
 The first to use the jump spark.  
 The first to use electric ignition.  
 The first to use a magneto.  
 The first to use double independent system of ignition, through two sets of spark plugs.

## First Come—First Served

will be the rule in allotting cars to the few new dealers which the increased Haynes output permits us to serve.

Contract now for your share of

## Haynes Cars With the Electric Gear Shift

You know what happened when the electric self-starter was introduced a couple of seasons ago. You recall how prospects flocked to see the cars with the new feature. You remember how the electric starter idea took and you also know what a hit the introduction of electric lights made. It's easy to forecast the hit that the electric gear shift will make. It is a greater improvement than either electric starter or lighting.

Possessing qualities for which they are famous—backed by 20 years of reputation—possessing everything else in modern equipment, the new Haynes models with Vulcan Electric Gear Shift give you the greatest selling proposition in the field.

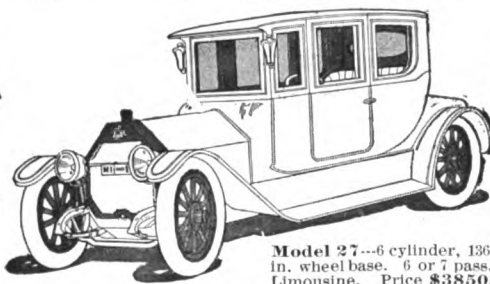
Regular Haynes dealers, of course, have the first claim on our output, but our capacity has been increased and there will be cars enough for a few new dealers. If you want to grasp this unequaled opportunity, better telegraph, write us special delivery or better still, hop on a train and come to Kokomo.

**The Haynes Automobile Co., 6 Main St., Kokomo, Ind.**

### PRICES

|   |                |                         |
|---|----------------|-------------------------|
| <b>Model 26</b> —130-in. wheel base, weight, 3800 lbs., 2 pass. Roadster, 4 or 5 pass. Touring, | <b>\$2700;</b> | Coupe <b>\$3200</b>     |
| <b>Model 27</b> —136-in. wheel base, weight, 4000 lbs., 6 or 7 pass. Touring                    | <b>\$2785;</b> | Limousine <b>\$3850</b> |
| <b>Model 28</b> —118-in. wheel base, weight, 3450 lbs., 2 pass. Roadster, 4 or 5 pass. Touring, | <b>\$1985;</b> | Coupe <b>\$2700</b>     |

*Hand levers optional on all models at \$200 reduction.*



**Model 27**—6 cylinder, 136-in. wheel base, 6 or 7 pass. Limousine. Price **\$3850.**



**When Writing to Advertisers, Please Mention The Automobile Journal.**



# ANNUAL ELECTRICAL NUMBER

## The MOTOR TRUCK

Devoted to Motor Driven Business Vehicles of All Classes.

### OCTOBER ISSUE

The Only Special Edition of the Magazine Recognized by the Industry, the Trade, the Owner and the Operator as the Authority on Electric Vehicle Haulage.

The MOTOR TRUCK Is the Only Publication That Consistently Devotes a Section of Each Issue to Articles Dealing with the Design, Construction, Care, Maintenance and Operation of Electric Wagons and Trucks.

This Number Will Not Be a Single Edition, Projected for the Temporary Profit of Publishers, but Will Be the Specialized Work of Men Known to the Electric World as the Authorities in All Phases of Vehicle, Service Station and Transportation Engineering.

The October Issue of the MOTOR TRUCK Will Be Published Just Prior to the Annual Show of Electric Vehicles in New York City,—the Largest Exhibition of the Kind in the World.

This Number Will Have Undoubted Value to Every Electrical Interest. It Will Have Equal Interest for the Motor Vehicle Industry Generally. As a Medium for Publicity for All Forms of Mechanical Transportation It Cannot Be Approached.

Reservations of Space in This Number Will Insure Superior Location.

**THE MOTOR TRUCK**  
TIMES BUILDING  
PAWTUCKET, R. I.

### Owners' Circulation

#### Sells The Cars

The AUTOMOBILE JOURNAL Has Published More Announcements by Leading Manufacturers of 1914 Productions Than Any Other Motoring Magazine.

This Is a Recognition by the Industry and the Trade of the Superior Quality of the Magazine for Publicity.

Practically All the Circulation of The Automobile Journal reaches the Buyers.

Manufacturers and Distributors of Parts, Accessories and Supplies Find It as Productive as the Builders of Cars. Those Who Own and Operate Automobiles Are Constant Buyers.

September 10, Next Issue

## The Automobile Journal

Times Building, Pawtucket, R. I.

### 12,000 Real Buyers

The Life Blood of the Motor Vehicle Industry and Trade.

Read Every Issue of the Only Magazine Published in Their Interest.

#### An Absolutely Guaranteed Service

Why Duplicate Publicity When You Can Reach Every Business Head with a Specialized Print?

All Yearly Advertisers in the Automobile Journal, the Motor Truck and the Accessory and Garage Journal Are Listed in the Buyers' Guides and Trade Directories, Which Have a Combined Circulation of MORE Than 1,000,000 Copies Annually.

Publishing Facts and Sample Copies  
at Request

## Accessory and Garage Journal

Times Building, Pawtucket, R. I.

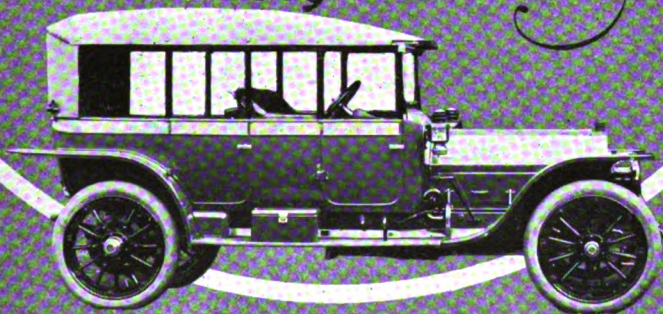


# SPRINGFIELD METAL BODY CO



Springfield Convertible Bodies  
A Construction Giving the  
Qualities of a Limousine & Tour-  
ing Equipment That May Be Con-  
verted as Quickly as a Folding Top  
Can be Raised or Lowered. When  
folded the Full Space of the Touring  
Car is Available — When Raised It  
is a Regular Top or It Can Be Glass  
Enclosed.

Dealers, Who Insist on Quality  
Equipment, Specify The Springfield  
Convertible Body.



# SPRINGFIELD, MASSACHUSETTS

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# The King of TIRES CATARACT

## Supremacy Due To Service Alone

No costly advertising campaign or corps of silver-tongued salesmen have enabled the

### Cataract Tires

to reach their position of Supremacy.

Tire Service to the owner alone has caused them to forge ahead. We build them right, of the best materials and workmanship, with the result that they cost less per mile than any other tire produced.

*Equip To-day with  
Cataract Tires and  
Eliminate Your Tire  
Troubles.*

**4,000 Mile Guarantee**

**CATARACT RUBBER  
COMPANY**

**WOOSTER, OHIO**

New England Branch—66 Hereford Street  
**BOSTON, MASS.**

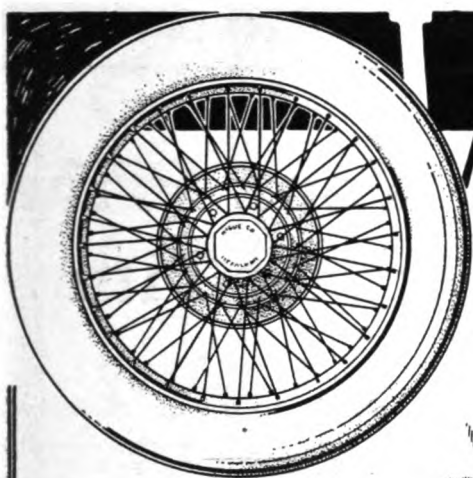
**NEW YORK**

**PROVIDENCE, R. I.**

HAC.

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## McCUE WIRE WHEELS

**O**NLY one tire burst in 570 mile race. Boillot, winning the French Grand Prix on a wire wheel Peugeot, blew out but one tire in the entire 570 miles. Towards the end of the race while making a stop for fuel he changed one other as a matter of precaution. The Excelsior cars, two of them, ran the entire 570 miles without making one single tire change. Commenting on the tire situation in this race "The Automobile" says: "There was very little tire trouble in the race. . . . Altogether the tire situation was very satisfactory, for this was the longest road race in the world—570 miles—and all European speed records were broken."

*Can you ask for more certain proof of the tire economy feature of wire wheels?*

Not a single wooden wheel equipped car competed in this French classic—certain proof of the confidence the world's greatest drivers have in the tire saving ability of wire wheels.

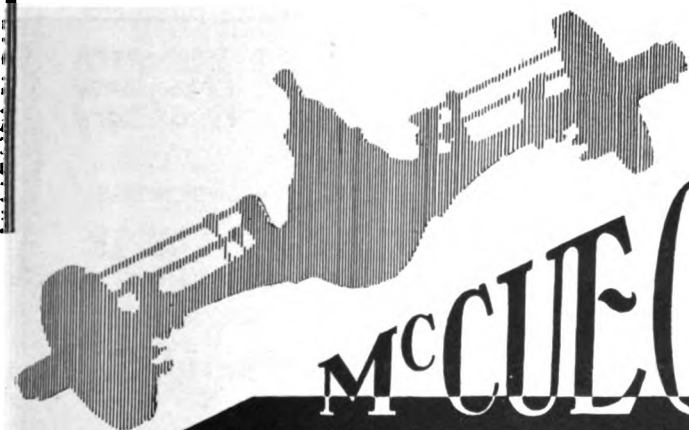
Insist upon wire wheels on your car for the reason that wire wheels

Increase tire mileage about 50 per cent.  
Safeguard your life in case of accident.  
Increase your car life.

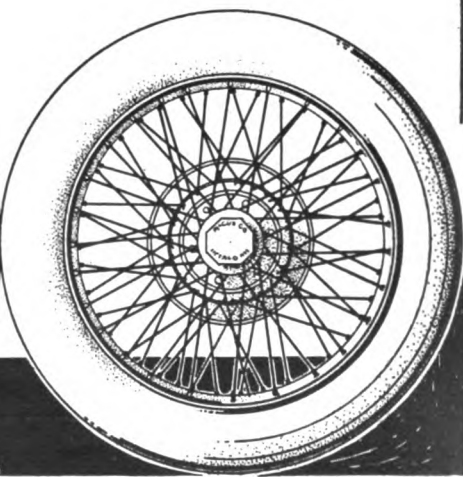
Make an easier riding car.  
Make an easier steering car.  
Make a better looking car.

Increase your mileage per gallon of fuel.

McCue Wire Wheels are equipped with (S) spokes, made by the Standard Company, of Torrington, Conn.



**McCUE CO.**  
**BUFFALO-N.Y.**



When Writing to Advertisers, Please Mention The Automobile Journal.





## Only Your Private Whether It's Time to

The automobile business *is* a business—not a pastime. It pays better for brains and backbone than most businesses. It penalizes mercilessly the chap who attempts to play with it and repays most liberally the man who works at it intelligently.

### Your Bank Roll is the Product of Your Brain

When you select a line of motor cars your fate is absolutely in your own hands. Success or failure is yours. Will you choose a car which eats up all your profits in service or will you select the car which stands up and keeps going smoothly in the hands of the average user?—that's the fellow you have to figure on. He's the chap who drives his car *hard*, breaks everything that will break, and tries to make you take the cost of maintenance out of your own profits. When you start to investigate various cars—think. While you are investigating them—*think*. Before you sign anybody's contract—THINK.

Make the maker whose contract you sign answer these questions to your satisfaction:

First: Is your car standardized—is it made out of parts which the public knows are the best

parts in the world's market—the standardized parts—the parts which offer the least possible sales resistance? The more easily a car sells the more sales you can close and the more money you can make—friend dealer.

Second: Is the stuff in your car so good that it is not continually breaking and costing the dealer unnecessary service expense? Service is the rat-hole down which most dealers put their profits. The sooner you stop this rat-hole with a Cole contract the sooner you will

### Make More Money

Third: Is your factory discounting all its bills—has it done so from its very beginning? Is it sound, and permanent and resourceful enough to always insure prompt fulfillment of orders? Will it be here to make good to your patrons the promises you have made them in good faith? Ask Bradstreet's and Dun's about them. It's rating and financial integrity which counts in this business, which gives you the backing which in turn makes it possible for you to—*Make More Money*. The Cole Motor Car Company in its entire history has never yet failed to discount a bill.

Fourth: Is the car in question beautiful,

## Cole Motor Car Company, Indianapolis, U. S. A.



# Ledger Can Show Hook Up With Cole



luxurious and full of eye appeal, aside from being sturdy and stout and strong? Remember that the woman in the case must like it before the man in the case will put up real money for it. The Cole is Motordom's fashion plate—the standard of beauty and the acme of “guts.” It couldn't be otherwise, because actually the world's greatest designers live over the drawing-boards whereon the lines and the construction of the Cole are determined—it is this beauty and beefishness of the Cole which helps you—make more money.

Fifth: Then show Mr. Manufacturer this Roll of Honor, and ask him how many of these standard parts are in *his* car. Then just silently bear in mind that the Cole has *all of them*.

There's no use going any further, now. You either believe in making more money or you are—content. If you believe in—more money you believe in the Standardized Car—the Cole. If you're content, stay with your present proposition—we can't make money for contented men. We want men who fight for supremacy—who stick out their chrome nickel jaws and bore in after business till competition tucks its tail and

runs. That's the kind the Cole Sales organization is made of. If you're our kind we can certainly guarantee that you—make more money. Just drop us a line. We need more men—like you.

Incidentally we have doubled our output and are in shape to make immediate deliveries. Nothing is of more importance to you than being able to deliver cars early.

## Cole Roll of Honor

### PARTS FOUND IN SERIES NINE COLE

Timken Axles and Bearings  
 Cole Three-Point Suspended Unit Power Plant  
 (Northway)  
 Mayo Radiator      Gemmer Steering Gear  
 Delco Electric System      Spicer Universal Joints  
 Detroit Steel Products Springs  
 Janney-Steinmetz Seamless Steel Gasoline Tank  
 Hydraulic Pressed Steel Frames  
 Firestone Tires      Firestone Demountable Rims  
 Warner Speedometer      Stromberg Carburetor  
 Taylor Tire Pump—Motor Driven  
 Collins Curtains

## Originators & Builders of the Standardized Car



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**EVERY CAR OWNER SHOULD USE ELECTRIC POLISHING CLOTHS.** Keep the new car from looking old and shabby and make the old car look like new. No. 1 cloth removes all spots and stains. No. 2 cloth gives a hard dry polish that will not gather dust. Saves half the time in washing. Price 50 cents a set by Parcel Post. Order now. A. & R. Co., Wallingford, Conn.

IMITATED  
BUT NOT  
DUPLICATED

**EAGLE**  
**NO CARBON**  
**AUTO OIL**

**THE OIL THAT SUITS  
AND DOES NOT SOOT.**

Carbon in your cylinders means loss of power. Customers report 10,000 to 15,000 miles with no carbon troubles. A good motto: TRY ANYTHING ONCE. EAGLEINE NO-CARBON AUTO OIL is furnished in 1-5-10 gallon, 30 and 50 gallon Steel Drums with faucets for which no extra charge is made.

**EAGLE OIL  
AND SUPPLY CO.**

104 BROAD STREET, BOSTON, MASS.



# Overland

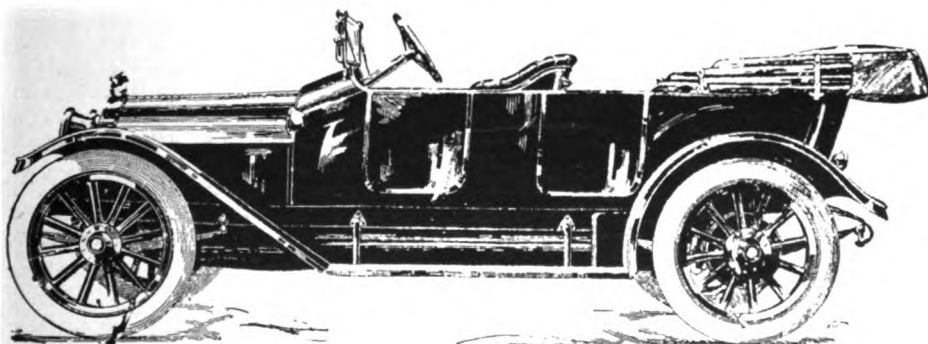
**C**OMPLETELY comfortable, a masterpiece mechanically, the big, sturdy, thirty horsepower, five passenger Overland touring car furnishes daily motor car gossip as the greatest value for the least money.

*Catalogue on request. Please address Dept. 52.*

**The Willys-Overland Co., Toledo, O.**

**\$950 Completely Equipped**

**With Gray & Davis Electric Starter and Generator—\$1075 f. o. b. Toledo.**



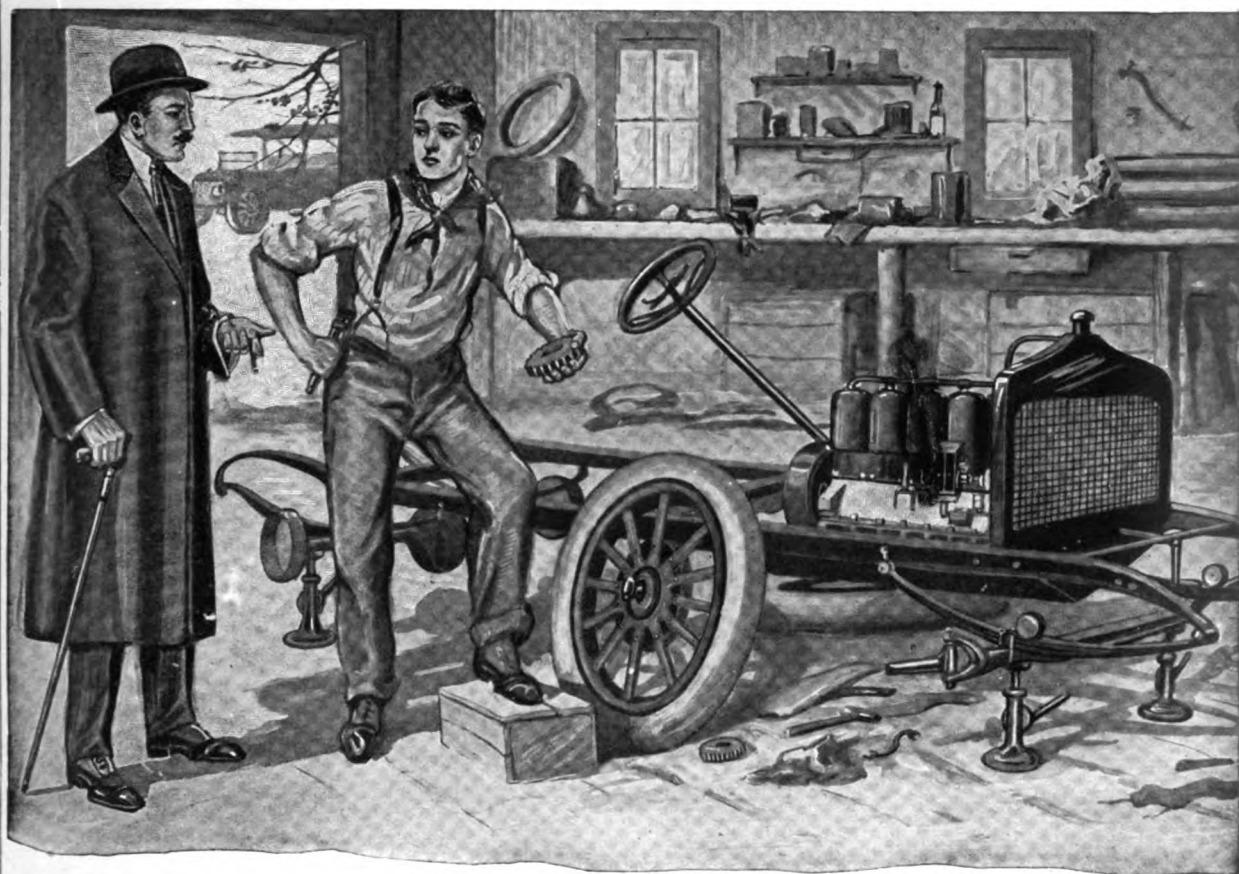




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\*Indicates article is illustrated.





## When the Repair man performs the Autopsy

he finds, nine times out of ten, that *poor lubrication* has caused all the costly havoc. Then he asks the simple question,



"Why don't you use

TRADE MARK  
**NON-FLUID OIL** ?"  
REGISTERED IN  
UNITED STATES PATENT OFFICE



and he tells in his honest way what he, as a mechanic, knows about the depredations of cheap lubricants.

## Why don't you use NON-FLUID OIL?

Get the genuine in orange colored cans.

### New York & New Jersey Lubricant Co.,

165 Broadway, New York

Chicago, 1430 Michigan Ave.

Philadelphia, 1431 Vine St.

When Writing to Advertisers, Please Mention The Automobile Journal.





# Saved!

**Weed Tire Chains enable you to safely make sharp turns and quick stops when a momentary loss of control means loss of life**

*The above picture illustrates one of the numerous situations in which you may be placed during bad road weather—when suddenly someone appears directly in your path and in a fraction of a second you must make a sharp turn and apply the brakes. It is then you require a firm unflinching grip on the road which can only be obtained by equipping all tires with*

## Weed Anti-Skid Chains

*The Only Device that absolutely Prevents Skidding*

No matter how expert and careful you are when driving on wet pavements and muddy roads, the treacherous bare tires are a handicap that defeats your very best efforts to prevent a skid.

The memory of one accident deters future enjoyment in the use of a car. Why run the risk of such accidents and why forfeit the pleasures of motoring

forever after, when safety can surely be yours by equipping all four tires with WEED CHAINS?

WEED CHAINS cannot injure tires because "they creep." Easily put on in a jiffy without the use of a jack or other tools. Directions packed with every pair.



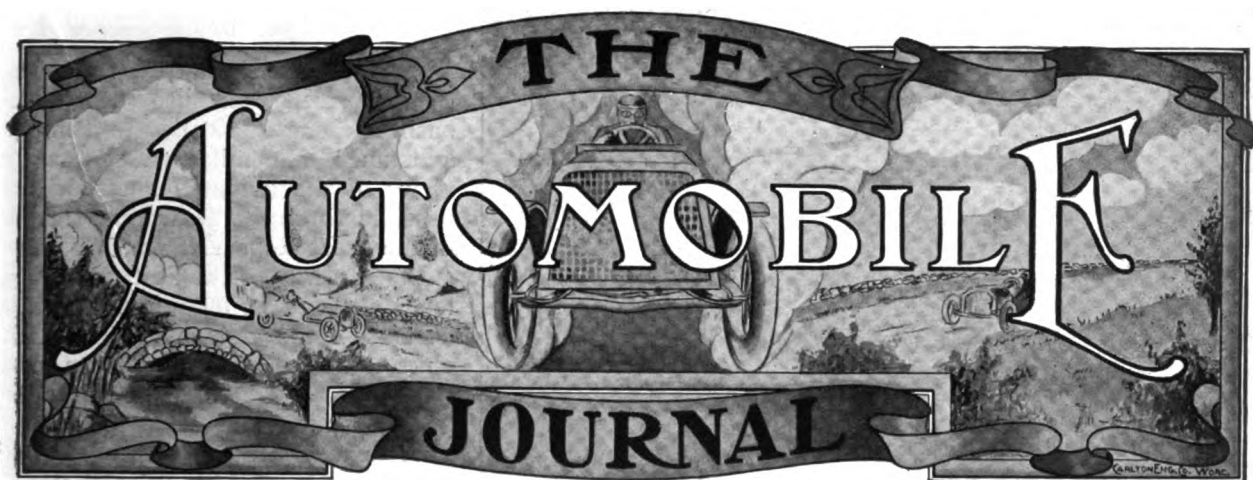
**WEED CHAIN TIRE GRIP CO., New York**

*Manufactured in Canada by*  
**DOMINION CHAIN CO., Limited—Head Office, Shaughnessy Bldg., Montreal, Canada**

**At all Dealers  
Selling Auto  
Supplies**

**When Writing to Advertisers, Please Mention The Automobile Journal.**





VOL. XXXVI, No. 2

AUGUST 25, 1913

Price, \$1.00 the Year

## GOVERNMENT ROAD TO ROOSEVELT DAM.

**A Remarkable Piece of Highway Engineering That Cost the United States Half a Million Dollars--What Arizona Is Doing for Good Roads.**

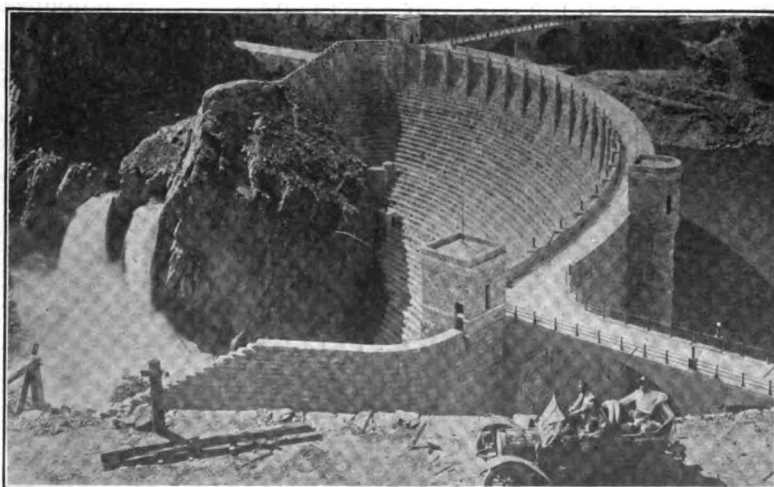
(By Harry Welch.)

**D**O YOU know that the finest road in the country is in Arizona? This road was built by the United States government for commercial purposes. There would be but the winding and weird Indian trail marking the path from Phoenix to the Tonto basin if the great Roosevelt dam had not been built. It was necessary to have a road through the mountains in order to haul the machinery to build the dam. The result is a scenic highway of easy grades, in the midst of a wealth of natural beauty with which only that of the famous Grand Canyon of Arizona can be compared.

From Phoenix to the Roosevelt dam is a trip of 80 miles (79.2 to be exact). It is a journey of constant contrast, of continuous change, through great gorges, along giant cliffs and into cool can-

yons. The strip of desert that is passed on the way presents a picture of plant life that is wonderful. New and strange forms of vegetation are on every hand. Brilliant flowers and a carpet of grasses and greenery make the so-called

desert a garden of delight. Birds are there in numbers—the dainty little Sonora dove, a miniature of the eastern wood dove; the cactus wren, with its nest secure among the spiny branches of the cholla, or giant cactus; great flights of white wings, the wild pigeon of the Southwest; quail, topknotted and plumed, and

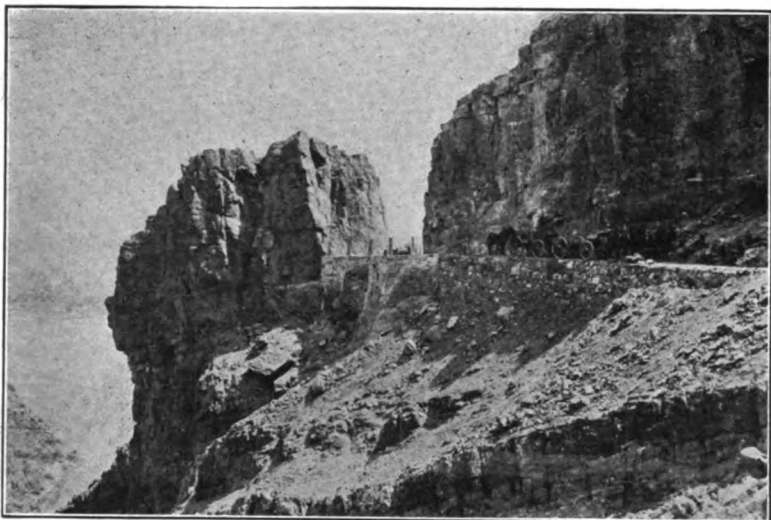


General View of the Roosevelt Dam in the Tonto Basin, Near the Confluence of the Tonto and Salt Rivers.

the chattering blue jay as well.

And then the mountains—Old Superstitions with their deep purple shadows, ever changing to blacks and blues, each change bringing out new forms and weird shapes; sheer cliffs, smooth





**Rock Cut on Phoenix-Roosevelt Road Directly Above East Wall of Dam Site.**

faced to contrast with the weatherings of countless years. Here are the evidences of the cycles of time; rock strata that are an open book to the student of geology, limestone and lavas, schists and rich red sandstone.

A trip to the West is an education, and the best way to see the West is by automobile. Following the famous flowing roads in Europe has no more charm than a trip over this wonderful winding way, now gradually ascending to unfold at every turn a new phase in the story of the "building of worlds"; now descending into the canyon to follow along the bank of the Salt river and watch its wonderfully clear water bubble and splash over the rocky bed. The highway passes through a section which was looked upon as practically inaccessible, and is in itself a remarkable engineering achievement. It cost the government a half a million dollars.

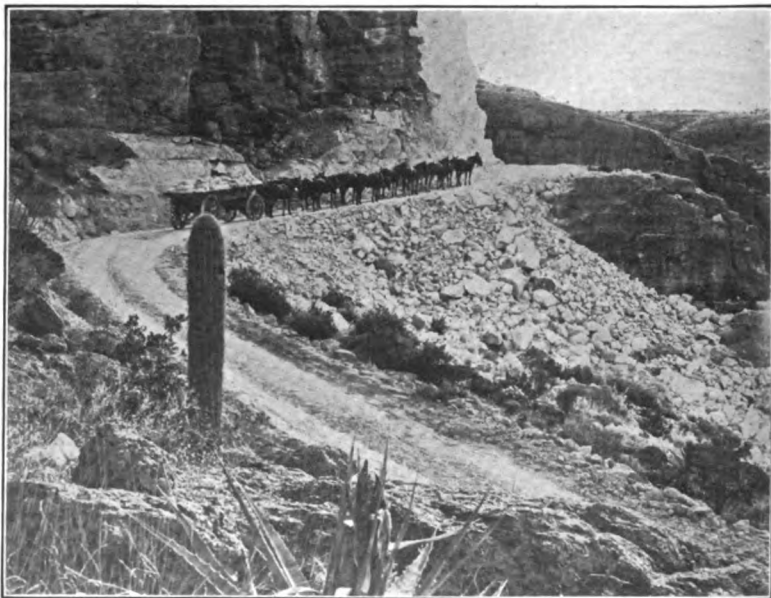
Phoenix is the capital city of Arizona, county seat of Maricopa county, and the state's chief commercial and social centre. It has a population of 20,000 and the finest winter climate in the world. The Salt river valley surrounding Phoenix has thousands of smiling farms, orchards blossoming, palms and roses nodding in the sunshine. The valley has 240,000 acres of irrigated land, the richest soil in the world, under the finest and most complete irrigation system that has ever been conceived and built.

The first portion of the trip over the Roosevelt road into the Tonto basin is along this valley to Tempe, a distance of 8.8 miles, with pleasing views of the irrigated lands, made possible through the waters stored in the great Roosevelt dam. Tempe is the gateway to the Salt river valley, a city of 2500 inhabitants on the ocean-to-ocean highway. One of its chief claims to distinction is its municipal water system with water 99 per cent. pure.

The way still leads through the valley to Mesa, 9.8 miles distant, termed the Gem City of the Salt river valley. It is in the most fertile section of the valley and is surrounded by the most densely populated agricultural portion of the

state. The lands have a perpetual right in the irrigation waters of the Salt river. The city itself has a population of nearly 3000, broad streets, comfortable homes and business houses that will compare favorably with those of 5000 to 10,000 inhabitants.

Here alfalfa yields five to eight crops annually. Citrus fruits ripen in time to be harvested and on the market before Thanksgiving Day. Vegetables are grown throughout the entire winter. The summer crops are corn, maize, cane, cotton, sugar beets, watermelons, tomatoes and the famous Mesa cantaloupes. Dairying has be-



**Fish Creek Hill on Roosevelt Road—Mule Teams Are Now Replaced by Motor Trucks.**



come a fine art, some of the finest prize winning herds of dairy cows in the southwest being owned by Mesa stockmen.

Soon after leaving Mesa, the real Roosevelt road is reached, and here every new view is a picture story of the chaos which once prevailed. In the great canyon of Fish creek the road for a mile or more is carved from the face of an immense cliff. From the top of the mountain, at this point 3000 feet above sea level, there is a wonderful view of Fish creek basin. Over 1000 feet below, and straight down, is the little rest house at which a stop may be made for meals. The scenery is magnificent. Sheer walls of sandstone rim the canyon on every side. Every color is reflected in the rocks; every conceivable contour is contained in the canyon crest.

After the descent into the canyon the tourist emerges at its northern outlet and begins a journey along the southern bank of the Salt river. At times the road is carried on a rock wall edging the river. At times it ascends little hills, leaving the stream below. Here are to be seen the long legged crane after fish, the great eagle encircling the peaks and other big birds which greet the stranger with startled screams. Soon the river is left for the last time, and, there begins the climb that will bring the visitor out on the mountain side level with the dam. Long hairpin curves sweep away into the cool shadows of a long, narrow canyon to emerge on a point which overlooks the great work.

At once the panorama opens. Water from Roosevelt Dam, After 80 Miles of Travel, Irrigating Sugar Beets in Salt River Valley.



In front is the great "Atlas of Stone" shouldering the rocks and holding back a great lake of water extending for 12 miles to the north and 12 miles to the south. Twenty-four miles of water—the largest artificial lake in the world. A supply that is large enough to irrigate the 240,000 acres included in the project in the valley 80 miles away.

Two great streams are emerging from the tunnels cut through the solid rock on the northern abutment. Two great concrete and steel bridges span the spillways, each 200 feet long. Across the top of the dam is a smooth roadway 20 feet wide, with a five-foot parapet wall on either side. At night the whole structure is outlined in electric lights, the power being generated by the water in its passage through the system.

The roadway crossing the dam leads north

into the Bayson country, where are to be found a great natural bridge and ruins of ancient cities that are little known. The lake created by the dam fills the Tonto basin, known in Indian days as the Bloody basin, the home of the Apaches, and later the rendezvous for cattle rustlers. All now is peace. The Apache is now a laborer on the great highway over which the dam is reached. The cattle man is a breeder of splendid stock. He has thoroughbred animals secured in the best eastern and foreign prize rings.

The road to the south skirts the lower arm of the great lake and traverses another interesting mountain range that extends into the famous White mountains. In these mountains are camping places that will appeal to the most ardent lover of nature undefiled—fishing in cool, sparkling streams fed from snow banks; hunting over

a rough country that is the haunt of the wild turkey, bear, deer, quail, grouse and other furred and feathered game. The automobile can with ease reach the camping places, and a little ride brings the camper again into the busy business places.

Through Arizona in all directions there are good roads for automobile travel. In the northern part of the state the ways are naturally good, requiring little other than attention, and proper grading and drainage. The material at hand is the best. Dividing the north and south portions of the state into two distinct sections is a range of hills running east and west. The hills are not difficult to negotiate and there are two or three roads across the range. Work, and hard work, is being spent to make these passable and easy.



Before many weeks they will compare with the good roads which prevail in the north.

In the southern portion of the state the same general conditions prevail. Good road making material abounds. The chief requisite is labor and drainage. Distances are great and the funds of the different counties must be expended over a large number of miles. It is surprising what favorable conditions have been secured through co-operation. Communities help repair their part of the main highways; one county will assist another in the construction of bridges and inter-county systems. To what size these counties in Arizona reach will be realized when it is remembered that Maricopa county, which is not the largest in Arizona, covers 7500 square miles, being equal in area to Massachusetts. It is more than equal to the area of the two states of Connecticut and Rhode Island combined.

in the new state and one that is gaining in favor every day. Whatever plan for an ocean-to-ocean highway is indorsed by the federal government, it is safe to say that it will pass through Arizona. Unquestionably, the first road across the continent will be one that can be used the whole year, and not one that will be "weather bound" for several months out of every 12. The line of any road that will be in use every month of the year must be through Arizona, and through the Salt river valley.

### **METZ VICTORIOUS ABROAD.**

**Glidden Trophy Winner Wins Similar Honors in Recent Australian Trials.**

The Metz Company, Waltham, Mass., has received word that one of its Metz cars received a



**Typical Automobile Drive in Arizona, with Fruit Trees Lining the Way on Either Side and the Mountains in the Distance.**

Logging of roads and the publishing of such logs or maps has been completed, and the result is a book of road maps that is a great credit to the state. Good roads days have been held in different sections, at which times whole families get out into the country and help put in shape the main thoroughfares. Interstate tours have been arranged, and tours in the state with large numbers of cars in line have been featured very successfully. Convict labor is being used to some extent and a concrete bridge is now being erected across the Salt river near Phoenix by state prisoners.

Arizona has a large and vigorous body of commercial organizations, several of which have for their sole purpose the encouragement of road construction. "Good roads" is a popular slogan

perfect score in the recent Sydney-Melbourne reliability trials in Australia. There were 24 entries, of which 21 started and 19 finished. Only nine secured full points for reliability.

The Melbourne Age in reporting the event said: "The outstanding feature of the trials was the performance of the little Metz car, weighing less than any other, which ran through the four days without losing a mark or having a puncture."

Aug. 20-21 were set aside by Gov. E. W. Major of Missouri as good roads days, the governor and every male person in the state contributing two days of work on the highways. Similar action has been taken by the governors of Kansas and Arkansas.



# CHARACTERISTICS OF HEAVY FUELS.

## Outlining Some of the Difficulties Attendant upon the Use of the Heavy Distillates of Petroleum in the Variable Speed Motor.

THE rise in the price of motor fuel during the latter part of 1912 and early in 1913 was viewed with alarm by motorists and those utiliz-

control, involves factors other than starting a cold motor and vaporizing the fuel. Those familiar with the basic principles of the gasoline engine know that the power impulse is the result of chemical action or combination between differing elements; that by suitably proportioning the fuel to the air an efficient combustion is obtained. The effects of too much or too little air in proportion to the fuel vapor are also known. If it is possible to construct a gasoline carburetor adaptable to an engine having a wide range of piston speed as in driving a car from five to 50 miles an hour the question naturally arises as to why heavy fuels cannot be utilized in a perfected carburetor, plus an effective vaporizer, with the same degree of success.

It is very obvious from general principles obtaining in nature that where a body is turned from one state to another, as from a solid to a liquid, or from a liquid to a gas, a certain amount of interchange of heat must take place, and the amount of heat absorbed is, of course, in proportion to the latent heat of the body. In the case of a liquid, such as petroleum spirit, which is of a complex nature, it is assumed that its latent heat of evaporation is of the order of 160 calories a kilogram, equal to 288 British thermal units a pound of fuel evaporated. That is to say, every pound of liquid passed through the carburetor requires an addition of heat equal to 288 British thermal units in order to evaporate it so that the resulting mixture shall remain at the same temperature as the external air. This does not signify

TABLE 1 (SOREL)

| Name             | Formula                         | Bolling point<br>Degrees C. | Specific gravity<br>at temperature<br>indicated<br>Degrees C. |
|------------------|---------------------------------|-----------------------------|---|
| Hexanet          | C <sub>6</sub> H <sub>14</sub>  | 69-71                       | .663 at 17  |
| Heptanet         | C <sub>7</sub> H <sub>16</sub>  | 98                          | .688 at 15  |
| Octane, Normal†  | C <sub>8</sub> H <sub>18</sub>  | 124                         | .719 at 0   |
| Octane, Isomere† | —                               | 119-120                     | .719 at 17  |
| Nonanet          | C <sub>9</sub> H <sub>20</sub>  | 149.5                       | .723 at 13.5  |
| Decane           | C <sub>10</sub> H <sub>22</sub> | 135-137                     | .742 at 12  |
| Undecane         | C <sub>11</sub> H <sub>24</sub> | 158-159                     | .736 at 18  |
| Dodecane         | C <sub>12</sub> H <sub>26</sub> | 180-182                     | .756 at 16  |
| Tredecane        | C <sub>13</sub> H <sub>28</sub> | 214.5                       | .755 at 15  |
| Tetradecane      | C <sub>14</sub> H <sub>30</sub> | 218-220                     | .778 at 15  |
| Pentadecane      | C <sub>15</sub> H <sub>32</sub> | 236-240                     | .796  |
|                  |                                 | 258-262                     | .809  |

†Chief constituents of motor spirit. \*And onwards chief constituents of kerosene.

ing internal combustion engines. In commenting on the situation the press and trade publications called attention to the increasing demand for gasoline, and predicted the use of heavy fuels, kerosene being most generally favored because of the fact that the products due to the distillation of crude petroleum yield approximately from 40 to 50 per cent., depending upon the richness of the crude, method of refining, etc. It was generally expected by the motoring public that the problems involved in the utilization of kerosene in the automobile motor would be solved speedily. But despite the fact that nearly nine months have elapsed since the price of fuel was practically doubled, the number of heavy fuel devices placed on the market is disappointing to those who looked to these for relief from the high cost of gasoline. Specific data as to the performances of the carburetors and vaporizers, or records of official tests, are not available, but it appears that at least one designer has produced a successful type in that the 1914 announcement of one car manufacturer specifies a kerosene carburetor as optional equipment.

The limited number of heavy fuel carburetors would seem to indicate that designers are confronted with problems not existent in carbureting gasoline, and that the construction of a device which will provide an efficient mixture under the variable speed and load conditions prevalent in the four-cycle engine, for instance, with throttle

TABLE 2 (SOREL)

| Tenths | Temperature<br>degrees C. | Specific<br>gravity | Substance<br>collected |
|--------|---------------------------|---------------------|------------------------|
| 1      | 52                        | .649                | Pentane & hexane       |
| 2      | 53                        | .647                |                        |
| 3      | 58                        | .653                |                        |
| 4      | 63                        | .678                |                        |
| 5      | 67                        | .666                | Hexane & heptane       |
| 6      | 71                        | .673                |                        |
| 7      | 79                        | .686                |                        |
| 8      | 89                        | .698                | Heptane & octane       |
| 9      | 120                       | .715                |                        |
| 1      | 66                        | .655                | Pentane                |
| 2      | 70                        | .644                | Hexane                 |
| 3      | 77                        | .676                | Hexane & heptane       |
| 4      | 84                        | .688                |                        |
| 5      | 90                        | .701                |                        |
| 6      | 101                       | .713                | Nonane & decane        |
| 7      | 112                       | .726                |                        |
| 8      | 123                       | .814                |                        |
| 9      | 160                       | .749                |                        |



TABLE 3 KEROSENE (SOREL)

| Tenths | Temperature<br>degrees C | Specific<br>gravity | Substance<br>collected    |
|--------|--------------------------|---------------------|---------------------------|
| 1      | 138-177                  | .755                | Nonane to undecane        |
| 2      | 177-197                  | .765                | Undecane to dodecane      |
| 3      | 197-212                  | .776                | Dodecane to tredecane     |
| 4      | 212-236                  | .783                | Tredecane to tetradecane  |
| 5      | 236-253                  | .796                | Tetradecane               |
| 6      | 253-274                  | .795                | Pentadecane to hexadecane |

how the heat is applied so long as the temperature of the resulting mixture remains what is desired. Theoretically, it is assumed that it is more suitable for the temperature of the incoming mixture to be as low as consistent and have the liquid remain in the evaporated or suspended state without precipitation.

#### Characteristics of Fuels.

The characteristic properties of fuels are shown in accompanying tables. It will be seen that the composition of motor fuels of the petroleum series of hydrocarbons, table 1, are somewhat complex, but the proportion of the lightest constituents is such that they are sufficient under ordinary circumstances to effect a fair proportion of the necessary carburetion when the air is cold. As it is better to vaporize the liquid completely before introducing it into the engine, the quantity of air supplied depends both on the composition of the fuel and on its vapor pressure and temperature.

The latent heat of vaporization lowers the temperature during carburetion, thus lowering the vapor pressure, and external heating must be resorted to in order to convert the suspended particles of fuel into a vapor and prevent their precipitation in liquid form. The vapor pressures of complex fuels depend chiefly upon that of their most volatile constituents, even though the proportion of these to the total mass of fuel is small. When air is admitted to the presence of such fuels, selective evaporation undoubtedly takes place; that is, the more volatile fractions are first taken up, leaving the heavier behind. When fuel is injected or sprayed into an air stream, selection affects the homogeneity of the mixture.

Redwood gives the figures presented below, showing the proportion of hydrocarbon vapor which air will take up, but these vary according to the volatility of the fuel, pressure, humidity and temperature of the atmosphere. For example, dry air will take up the following quantities of vapor from gasoline having a specific gravity of .65 before the air is saturated:

|      |                              |
|------|------------------------------|
| 10.7 | per cent. by volume at 32° F |
| 17.5 | " " " " 50° F                |
| 27.0 | " " " " 68° F                |

These percentages are equivalent to one volume of vapor to 5.7 of air at 50 degrees and one volume to 3.7 at 68 degrees Fahrenheit, showing that a small increase in the temperature largely increases the percentage of gasoline vapor which can be retained by the air.

#### Absorption of Fuels by Air.

Gasoline of a specific gravity of .70 containing 83.72 per cent. carbon and 16.28 per cent. hydrogen, has a vapor density of .24 pounds a cubic foot at atmospheric pressure, when at a temperature of 32 degrees Fahrenheit, or nearly three times the density of air. In another form the amount of liquid fuel which can be absorbed by 100 volumes of air at a temperature of 60 degrees Fahrenheit varies with the density of liquid as follows:

TABLE 4.

| Specific gravity<br>of liquid fuel | Percentage<br>of liquid<br>air by volume |
|------------------------------------|--|
| .639                               | .59                                      |
| .679                               | .18                                      |
| .700                               | .17                                      |

As is shown by the accompanying tables, the nature of the fuel is very complex, consisting as it does of a considerable variety of the methane series, containing various percentages of unsaturated hydrocarbons. The specific gravities of these various fractions give some indication as to their behavior as regards evaporation, for it will be noted in table 2 that pentane and hexane exist principally in those fractions the specific gravity of which is below .666, heptane then follows up to .698 and octane at .715.

TABLE 5 (BAILLIE)

| Fuel               | Minimum temperature at<br>which fuel can exist as a<br>vapour ° C |                          | Formula                         | Drop of<br>temperature<br>due to<br>evaporation in<br>correct amount<br>of air ° C |      | Drop of<br>of temperature<br>due to evaporation<br>Density 20 per<br>at 15° C cent. less air |       | Boiling<br>point deg. C | Lower<br>calorific<br>value a<br>litre |
|--------------------|---|--------------------------|---------------------------------|--|------|--|-------|-------------------------|--|
|                    | Cor. amt.<br>of air   | 20 per cent.<br>less air |                                 |  |      |  |       |                         |  |
| Hexane .....       | 17.7  | 14.2                     | C <sub>6</sub> H <sub>14</sub>  | 19.0   | .674 | 23.3   | 68.5  | 7,155                   |  |
| Heptane .....      | 3.6   | 7.3                      | C <sub>7</sub> H <sub>16</sub>  | 17.9   | .688 | 23.4   | 98.0  | 7,380                   |  |
| Octane .....       | 19.0  | 22.9                     | C <sub>8</sub> H <sub>18</sub>  | 17.2   | .719 | 21.5   | 120.0 | 7,560                   |  |
| Nonane .....       | —   | —                        | C <sub>9</sub> H <sub>20</sub>  | —  | .740 | —  | 136.0 | 7,900                   |  |
| Decane .....       | 4.2   | 46.1                     | C <sub>10</sub> H <sub>22</sub> | 14.8   | .738 | 18.5   | 160.0 | 8,060                   |  |
| Benzene .....      | 4.3   | 0.7                      | C <sub>6</sub> H <sub>6</sub>   | 32.2   | .884 | 47.3   | 80.4  | 9,690                   |  |
| Ethyl alcohol..... | 23.3  | 26.5                     | C <sub>2</sub> H <sub>6</sub>   | 76.3   | .794 | 95.5   | 95.5  | 5,270                   |  |



The heavier hydrocarbons represented by nonane and decane appear with a specific gravity from .726 to .749, and these are largely present in commercial motor fuels in use at the present time. The significance of these constituents lies in the amount of air necessary to effect carburetion, and the minimum temperatures at which mixtures of air and fuel can exist when the fuel can remain as vapor without precipitation in the form of liquid particles. By referring to table 5, it will be seen that there is a large range of temperatures between which the various fractions under consideration can be used in a carburetor with success.

It will be noted that as the density of the fuel increases through the series, the drop of temperature upon vaporization also decreases, and that outside the methane series, a greatly increased addition of heat is necessary. By referring to table 4 it will be seen that as the density of the fuel increases, a smaller proportion of fuel to air is required to produce a maximum explosive effort. One authority holds that this is almost self-governing in a gasoline carburetor system, for as the density of the fuel increases, in the petroleum series, its viscosity also increases, so that the amount of fuel of a greater density which flows through a given orifice very nearly adjusts itself in accordance with the requirements. In other words, if a gallon of fuel contains a greater number of thermal units on account of its density, it takes a longer time to flow through a given orifice than a gallon of fuel containing a lesser number of thermal units.

#### **Flow of Liquid Fuels.**

The prime factors to be considered in determining the quantity of liquid fuel that will flow through a carburetor or jet orifice are: The viscosity of the fuel, its temperature, shape of the orifice and the effective head actuating at the orifice. Viscosity and temperature of the fuel bear a certain relation to each other, as the higher the temperature the lower will be the viscosity, and a greater volume will flow through an orifice in unit time as the temperature is increased. If radiation or conduction of heat from the engine is allowed to influence the float chamber and the fuel contained therein, an increase of fuel supply will result as the heat of the motor increases. In considering the effect of temperature upon the viscosity of the fuel, an increase of 20 per cent. of fuel flow may occur when the carburetor is hot as compared with the fuel flow when the instrument is cold. When the regulation is perfect before the engine has attained working conditions of temperature the mixture will be too rich for normal running.

Reference has been made to vapor pressure, a subject which has not received much attention in carburetor designing, because it has not been made use of in many instances. It is useful to know that the vapor pressure increases with the temperature, and naturally, with the richness of the mixture when working near the saturation point. In one instrument this property of vapor is utilized to govern the discharge of the fuel from the jet orifice, the jet itself discharging into a tube, and as the mixture tends to become enriched under high suction of the engine, the jet tends to give an increased coefficient of discharge, accompanied by a tendency toward increased vapor pressures within the tube.

The writer has endeavored to show the characteristic properties of fuels and the minimum temperatures at which mixtures of fuel and air can exist without precipitation in the form of liquid particles. This precipitation or condensation is an important factor in the use of heavy fuels in the automobile engine, as will be pointed out in logical sequence.

#### **Possibilities of Kerosene.**

In considering the possibility of kerosene as a motor fuel, the idea that its vapor cannot be ignited as easily as that of gasoline is erroneous. Produce a true vapor and maintain it up to the time of its ignition by the spark, and the resulting combustion will be satisfactory. Kerosene being less volatile than gasoline at ordinary temperatures and pressures, that is, does not vaporize as readily, requires a larger supply of heat. Early designers of kerosene carburetors believed that its use involved only the application of heat to the gasoline carburetor, and while it is admitted that an automobile engine which has been operated long enough to have attained an average operating temperature can be made to continue on a kerosene and air mixture, its capacity is apt to be more or less uncertain.

When used in an ordinary carburetor, the liquid jet is carried satisfactorily by the air, as is the gasoline jet, but it is not as readily vaporized, and a certain amount will enter the cylinder as a liquid or be deposited in the intake pipe. Part of the mixture entering the cylinder as liquid will generally remain as such until combustion has begun. When this takes place, the high temperature tends to vaporize the liquid, and another process known as "cracking" occurs simultaneously. Cracking consists of the breaking up of the molecules of the liquid kerosene, some of the resultant products being finely divided carbon and heavy viscous liquids. The more the kerosene is broken up, that is, the more perfectly it is atomized or sprayed into the air, the less op-



portunity for the collection of the liquid on solid surfaces and the more rapid will be the vaporization within the cylinder of the engine.

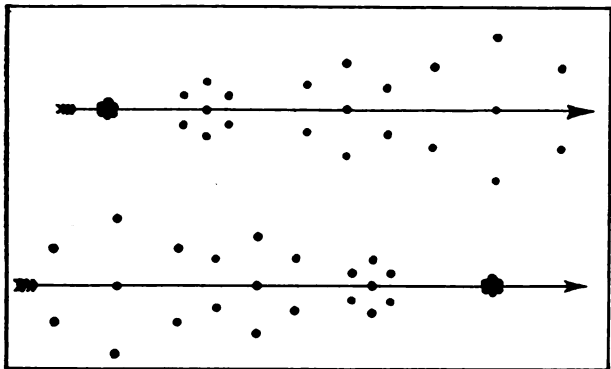


Fig. 1—Illustrating the Volatility of Gasoline Above and Below the Combustible Nature of Petroleum.

At Fig. 1 is presented digrammatically the volatility of gasoline above and the condensable nature of petroleum. A particle of gasoline projected from a spray nozzle automatically opens out as vapor as it proceeds in the direction of the arrow, from left to right. The volume of petroleum vapor on the other hand closes in automatically to final condensation, as indicated. By this is not meant that gasoline is volatile and that kerosene condenses. It merely emphasizes the fundamental distinction between the two fuels.

The construction of a kerosene or heavy fuel device for an engine having a constant load and operating at a constant speed is not difficult, because a certain amount of heat is required each engine working stroke, and the load also being constant, the quality of the spraying may be comparatively poor if the walls are not above a certain temperature. With the heat of the exhaust utilized, and this being constant, the work of construction is greatly simplified. But if the load or speed be considerably varied, trouble is experienced.

#### Effect of Varying Control.

From the above it may be inferred that the varying of control with a four-cycle motor, throttle controlled, has an effect upon the mixture within the cylinder walls, and that the proportion of air to the fuel is not the chief difficulty attendant upon the use of heavy fuels. The result of varying throttle control is to vary the amount of the charge and the compression. To vary the compression is to vary the temperature of compression, and it is held that the ultimate result is to vary vaporizer temperature; or in other words, the heat of the compressed charge is raised or lowered, correspondingly. In these two factors, varied air influx to motor and varying tempera-

ture of compression, are held to be two sources of trouble to the inventor of the heavy fuel carburetor. The variation of air flow is primarily one of velocity, and it has but little effect on an engine running on a fixed amount of gas.

#### Air Velocity a Factor.

The immediate difficulty with variable air velocity is the change that results in the quality of the spray, when piston speed falls as suggested in the diagram at Fig. 2, where the size of the spray particles is shown approximately corresponding to the air velocity (proportionate to the length of the arrows), the increase of blast power more effectively pulverizing the fuel. To remedy this there may be provided what amounts to a variable choke tube, whereby, as the engine speed varies, so will the area of the air inlet be raised, but other factors may be affected. In the gasoline carburetor a taper needle valve is so connected to the air valve that, as the engine suction increases, the amount of fuel and air is increased, maintaining approximately constant proportions of gasoline and air at all motor speeds.

In designs for heavy fuel devices not only must proportionate mixture be considered, but the character of the spray, since spray as such (liquid fuel in droplets) is to be assumed one of the principal causes of smoky exhaust. Variation of the spray, that is, variation in the degree of fineness to which the fuel is broken up, is an important factor in the construction and operation of the spraying type of carburetor employing heavy fuels. It is held by one authority that degeneration in the character of the oil spray attends reduced piston speed velocity; that the result of varied air influx, the resultant of varying speed originated by varying load, is starving

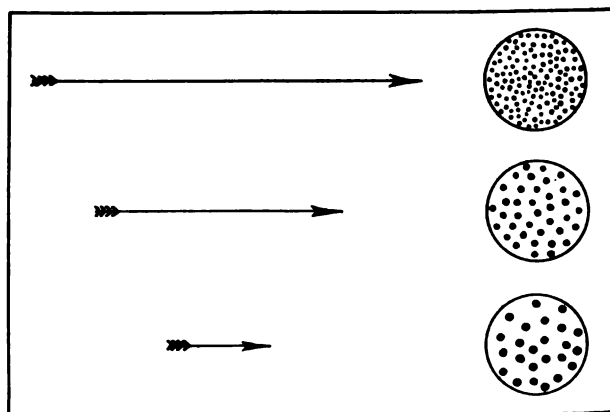


Fig. 2—Change Resulting in Quality of Spray Due to Variable Air Velocity.

the engine by reason of the incombustible nature of the feed that has degenerated from a mist to a form of coarse spray.



It may be argued that some of the variable speed running conditions exist in the use of gasoline, and while this is admitted, for some not easily determinable reason, the coarse spray of gasoline does not produce the same visible exhaust as does the same condition with heavy fuels. The overloaded, slowed down gasoline motor does not produce smoke unless the fuel is greatly in excess, although odor is noticeable. In explanation, it may be stated that what produces smell in one case produces that plus smoke in another. It may be that coarse gasoline spray readily turns into vapor, and that the exhaust is vaporous, whereas with heavy fuel being condensable, particles issue from the motor not fully burned.

It will be seen that three factors are to be considered in the successful utilization of heavy fuel: First, effective pulverization; second, complete combustion; third, a high state of carburetion—mixing of air and combustible.

#### **To Be Continued.**

Ed. Note—The next installment will deal with the methods employed in preparing heavy fuels, such as kerosene, etc., for combustion in an engine.

### **TO DISCONTINUE PRODUCTION.**

#### **Maker of Alco Cars and Trucks Decides to Retire from the Industry.**

Not in years has the industry experienced a greater surprise than was occasioned when the American Locomotive Company, New York City and Providence, R. I., maker of Alco pleasure cars and motor trucks, announced its decision to discontinue the automobile department of its business, in the following statement issued from the New York office, which is located at 1886 Broadway.

The board of directors of this company, at a meeting held on Aug. 13, 1913, decided to discontinue the manufacture and sale of automobiles and motor trucks. The company takes this opportunity to assure all owners of Alco vehicles that arrangements will be made to furnish them with repair parts for a period of not less than five years to come, and, further, that it will fulfill in every respect its obligations given under guarantee to its customers.

AMERICAN LOCOMOTIVE COMPANY.

W. H. Marshall, President.

It is understood that the automobile department has not been as profitable as the other line in which the company is engaged, although the Alco car is one of the highest priced in America, selling at \$6000. The company began the manufacture of Alco automobiles in 1906, when the machine was known as the American Berliet, the

American rights to the Berliet patents having been secured. The plant at Providence, R. I., with its equipment, is valued at \$3,000,000. Nearly as much more capital is invested in branches and service stations in various parts of the country. In the absence of additional information the ultimate disposal of these properties is a matter of conjecture only.

### **NEW BOSCH BRANCH.**

#### **All Distributors East of Mississippi to Be Handled from New York City.**

A New York branch of the Bosch Magneto Company, New York City, has been organized for the purpose of giving undivided attention to the increasing number of Bosch users in its territory. The details of operations previously carried on by the executive officers and staff are now taken care of by the new branch, in a field known as the eastern territory, made up of all the states east of the Ohio and Mississippi rivers.

Space in the Bosch building, 223 West 46th street, New York City, has been temporarily made over to the new branch, where its activities will be carried on until the growing needs of the executive and main office forces, or the normal increase of its own needs shall make it necessary to find new quarters. The branch is in charge of Alfred J. Poole, formerly assistant chief engineer, who has an adequate corps of assistants.

### **ELGIN ROAD RACES.**

#### **Twenty-One Entrants for Chicago Automobile Club and Elgin National Trophies.**

Only two events are scheduled for the fourth annual Elgin road race meet, to be held at Elgin, Ill., Aug. 29-30, under the auspices of the Chicago Automobile Club and Elgin Automobile Road Race Association. Twenty-one machines have been nominated, eight for the contest for the Chicago Automobile Club trophy, formerly the Cobe cup, on Friday, and 13 for the Elgin National trophy, now held by Ralph DePalma, in a Mercedes, on Saturday. Each race will be for 305 miles. The cars and drivers are:

Chicago Automobile Club trophy—Mercer, DePalma; Mercer, Wishart; Mason, Mulford; Mason, Rickenbacher; Nyberg, Madden; Case, W. Endicott; Special, M. Roberts; Deltal, Dawson. Elgin National trophy—Marmon, Dawson; Isotta, Grant; Mercer, DePalma; Mercer, Wishart; Mason, Haupt; Mason, Rickenbacher; Stutz, Anderson; Erwin special, Bergdoll; Case, W. Endicott; Tulsa, Hughes; Nyberg, H. Endicott; Keeton, Burman; Deltal, not named.

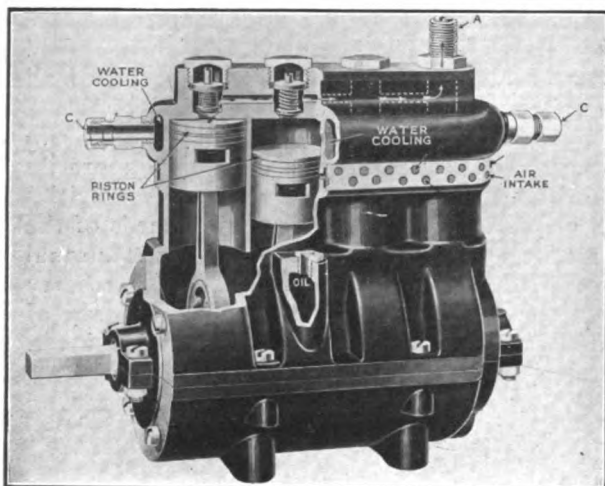


### STEWART POWER AIR PUMP.

#### Stewart-Warner Speedometer Corporation Announces Compact Four-Cylinder Unit.

The Stewart-Warner Speedometer Corporation, Chicago, announces a four-cylinder air pump designed for inflating tires and for compressed air motor starters. It is made in two models, air and water-cooled, and although primarily designed to be driven by the motor, is also furnished with a crank handle, permitting of mounting on the running board and being operated by hand.

The pump is very compact, being eight inches high, 7.5 long and four wide, and resembles an automobile motor in appearance. It is built similar to a four-cylinder gasoline engine and is fitted with a drop forged crankshaft ground to size,



**Stewart Four-Cylinder Air Pump, Built Like an Automobile Motor and Having Four Impulses to Each Revolution of the Crankshaft.**

metal pistons, piston rings, connecting rods, splash lubrication, etc. The construction of the pump is shown in an accompanying illustration, and it will be noted that the air is admitted to the cylinders through apertures in the cylinder walls just above the piston head and when the piston is in its lowest possible position. The air intake is screened to prevent entrance of foreign elements. The valve in the head is ground to a perfect seat and retained by a strong tension spring. The passage of the air to the outlet at A is shown in the illustration by arrows.

The cylinders have a bore of 1.4375 inches and stroke of 1.125. The connecting rods are drop forged and heat treated. They are driven by means of eccentrics working within the lower ring on the connecting rod, a design eliminating

a large number of parts. These rings are fitted carefully to prevent the lubricant from working into the compression space, but as a precaution each pump is fitted with a separator located on the pipe line just above the connection of the pipe line with the pump. The water-cooled unit is provided with unions C C for connecting with the circulating systems of the motor, and four holes drilled in the base of the pump provide easy means for installing.

Unlike the automobile engine, the Stewart is productive of four compression impulses with each revolution of the crankshaft, insuring a continuous and steady flow of atmosphere to the tire or air tank. At a speed of 500 revolutions a minute this means 2000 impulses. A high grade pressure gauge is supplied with each pump, also 10 feet of hose and all necessary connections.

### STUDEBAKER INSTALLS PARTS PLANT.

#### Move Insures Adequate Supply of Parts for Former Models at All Times.

By placing at the disposal of its service department an entire plant, completely equipped with machinery and able to turn out on short notice parts for every model of its cars now in the hands of the public, the Studebaker Corporation, Detroit, maker of Studebaker cars, has taken an advanced step in what it believes to be the ideal relationship between manufacturer and the owners of and dealers in its machines.

The plant purchased by the company is at Pontiac, Mich., and was formerly known as the Vulcan Gear Works. Aside from insuring a permanent supply of parts for all Studebaker models, an additional advantage lies in the ability to turn out for each Studebaker dealer a stock of parts fitted to the needs of his territory, thus permitting him to install immediate repairs on any Studebaker vehicle.

It is of interest to note that 97 of the 98 entrants in the recent French military trials for trucks and tractors were mounted on rubber tires. These trials are held each year under the auspices of the war department for the purpose of determining the vehicles which shall be eligible for government subsidy for military purposes. The preferences of French manufacturers in the matter of tires this year indicated a decided triumph for the Gaulois make, represented in this country by the Gaulois Tire Corporation, 1926 Broadway, New York City, these being fitted to 78 per cent. of the vehicles entered.



**TRAFFIC COMMITTEE APPOINTED.****International Travel Club Announces Personnel of Important Board.**

As was announced in a recent issue of The Automobile Journal, the International Travel Club, meeting in New York City, decided to proceed at once toward the formation of a committee to take up the matter of uniform traffic regulations in the larger cities. This committee has been appointed as follows: Chairman, Charles Jerome Edwards, Brooklyn, N. Y.; vice chairman, William Phelps Eno, New York City and Washington; Howard Elliott, St. Paul, Minn.; Julius P. Meyer, New York City; Edward G. Connette, Buffalo, N. Y.; David Beecroft, Chicago; Charles Henry Davis, South Yarmouth, Mass.; Samuel Walter Taylor, New York City; Carl H. Page, New York City; Albert S. Callan, Chatham, N. Y.; Burns Lyman Smith, Syracuse, N. Y.; Robert Lee Morrell, New York City; Frederick H. Elliott, secretary of the club.

The personnel of this committee is composed of men who have given much thought to this and kindred subjects. Mr. Edwards is a well-known traveller and has been an executive in many clubs. He is at present prominent in the insurance world as manager of the Equitable Life Assurance Society. Mr. Eno is the author of the traffic regulations now in use in several American cities, London and Paris. Mr. Meyer is director of the Hamburg-American Line. Mr. Connette formerly was chief engineer of the public service commission, first district, State of New York, and is now president of the International Railway Company. Mr. Beecroft is a well-known automobile editor. Mr. Davis is president of the National Highways Association, and is actively engaged in an extensive campaign in behalf of the good roads movement. Mr. Taylor is editor of *Rider and Driver*, and is a member of the New York state commission to confer with commissions from other states on uniform motoring laws. Mr. Page is widely known as an automobile distributor. Mr. Callan is the author of the so-called Callan automobile law in New York. Mr. Smith is an enthusiastic traveller and is connected with the typewriter industry in Syracuse. Mr. Morrell has been prominently identified with motoring and good roads for a number of years, and only recently was appointed chairman of the law and ordinance committee of the Manhattan Automobile Club. Howard Elliott is president-elect of the New York, New Haven & Hartford Railroad, and Frederick Elliott has been closely

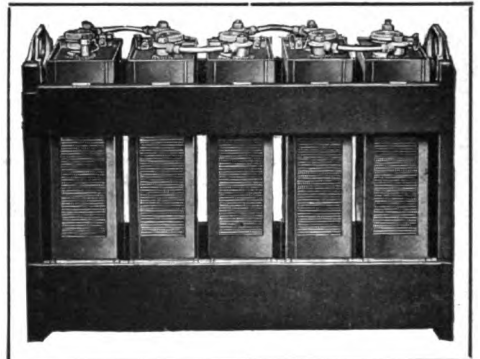
identified with the motoring department in New York State and with numerous automobile organizations.

**NEW EDISON BATTERY.****Cell Designed for Use in Pleasure Cars and Light Delivery Wagons.**

The Edison Storage Battery Company, Lakeside avenue, Orange, N. J., has brought out a new type A-5 nickel-iron alkaline cell, with rated capacity of 187.5 ampere-hours, intermediate between type A-4, 150 ampere-hours, and type A-6, 225 ampere-hours. The new battery is designed for pleasure cars, for 1000-pound delivery wagons, for industrial and baggage trucks, and for similar light work where the type A-6 has proved to be more than sufficient.

It is maintained by the company that in the type A-5 Edison battery there is a "springiness" and feeling of power given to the control that is

particularly pleasing to the operator. Like the other Edison vehicle batteries, it carries a guarantee that it will be



The New Type A-5 Edison Cells in a Tray.

capable of developing its full rated capacity at the end of four years. The general terms of this guarantee require simply that evaporation of the electrolyte be replaced by distilled water to keep the plates covered; that every eight months or so the electrolyte—a solution of potassium hydrate with a little lithium hydrate—be renewed, and that the cells be kept reasonably clean.

As is more or less well known, it is held that the Edison battery is not injured by occasional high rates of discharge, that it may be left "on charge" indefinitely, and that it may even be put on charge in reverse direction without harm. The container, grids, poles, etc., are all made of heavily nickel plated steel, and it is said to be practically impossible to damage any part of the cell by falls, jars or collisions. The accompanying illustration presents the new battery and tray.



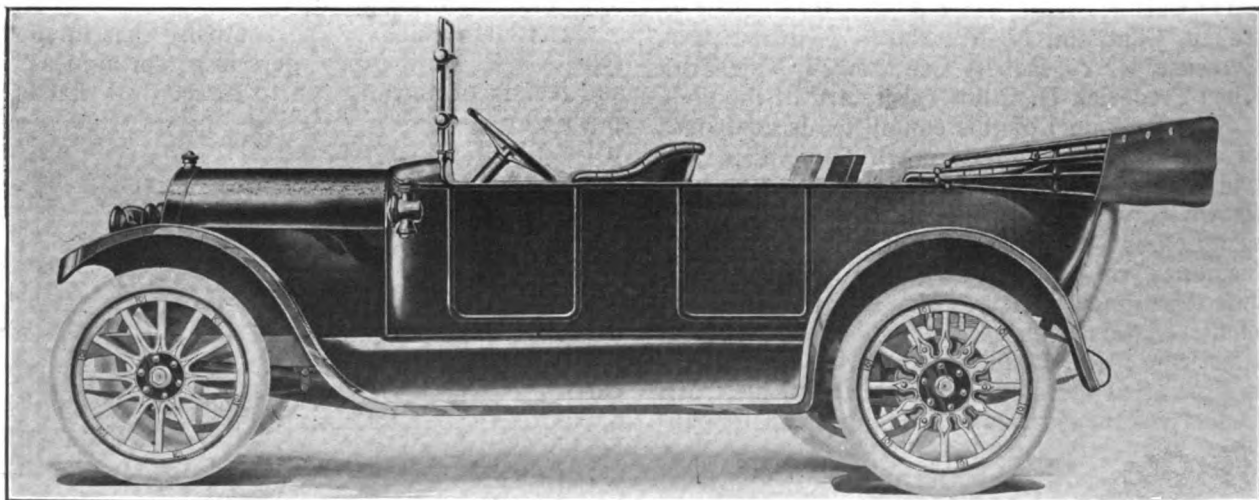
## DETAILS OF PARTIN-PALMER "38" TOURING CAR.

**I**T IS contended by some that there is to be little that is new in the constructional features of new models; that is, that aside from minor changes and refinements, in the main the same mechanical details are to be continued in the 1914 product. This does not apply to the Partin-Palmer "38," a popular priced six-passenger touring car produced by the Partin Manufacturing Company, Chicago, with a factory at Detroit. Details of the recent Partin-Palmer combination were announced in the issue of *The Automobile Journal* for July 25.

The most striking feature of the new chassis is the motor, presenting as it does, a novel application of principles endorsed by sound engineering practise. As will be noted by the accom-

pounds to the square inch. The valves are carried without cages and the rocker arms generally utilized are eliminated by forming the valve seats directly in the head. The valves have a port diameter of 1.375 inches, the intake being located on the left hand side and the exhaust on the right. The enclosed feature is obtained by the core method. The valve guides are of gray iron and the adjustable tappets are of steel, hardened and ground. They are actuated by drop forged camshaft, having integral cams and rotating in three large bearings.

The crankshaft is a 40 point carbon steel, drop forged and carefully ground. Three bearings are utilized, these being stepped, and as follows: Front, two inches; centre, 2.109375; rear,



**Partin-Palmer, a Six-Passenger Touring Car Having a Well Designed Chassis and Motor of Ample Capacity.**

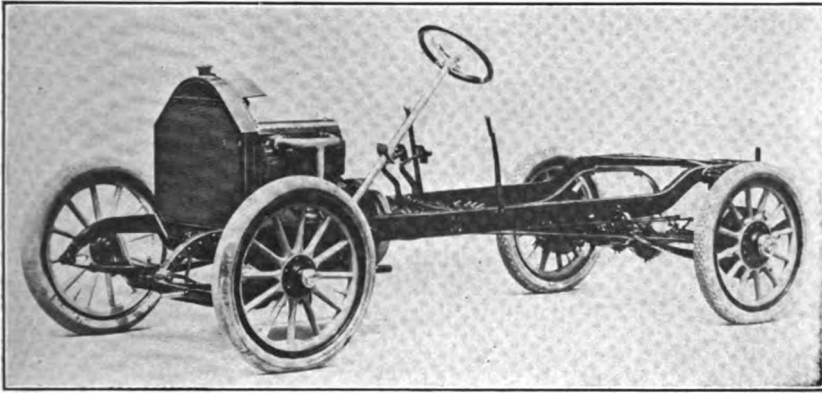
panying illustrations of the intake and exhaust sides of the power plant, the designer has obtained a valve-in-the-head construction and fully enclosed these members, a design making for high efficiency, as well as noiseless operation. The cylinders are cast en bloc with the upper half of the crankcase, and the cylinder head is removable, a practise that is gaining adherents among makers of motors of the block type, and one making for rigidity, as well as eliminating the joint at the base of the cylinders. The design also makes for simplicity in that the number of parts is reduced. Accessibility is another factor, the work of removing carbon deposits and the inspection of valves, etc., being simplified.

The head is secured to the cylinder casting by bolts, the joint being made with copper asbestos rings, having a pressure resistance of over 3000

2.140525. The lengths are three, 2.5 and 3.6875 inches, respectively. The bearing material is a special alloy. The dimensions insure uniform strength throughout. The connecting rods are drop forged, the dimensions of the large end being 2.625 by 1.75 inches, those of the smaller end 2.25 by one inch. The pistons are carefully ground to size and carry three eccentric rings above the wristpin, which is a seamless steel tube of carbon steel, hardened and ground. They oscillate in piston bosses. The crankcase is divided at the centre, the lower section being of pressed steel. The timing gears are spiral, enclosed by the conventional housing at the front.

The method of cooling employed should make for great efficiency in operation. Both the intake and exhaust passages are cast in the head section, which is thoroughly cooled by the liberal sized





Side View of Partin-Palmer "38" Chassis, Showing Frame Construction, Making for a Low Centre of Gravity.

water jackets. The water jacketing of the exhaust is a feature and should minimize back pressure by the cooling of the exhaust gases, which are led to a single port, thence through a large diameter straight outlet to the tube connecting with the muffler. In keeping with the simple design is the bolting of the outlet water manifold, having a two-inch diameter, to the head, and the inlet to the cylinder casting, a construction permitting of the displacement of the head without disturbing the radiator. Cooling is by thermo-syphon, the method of casting the cylinder and head being very favorable to this system. The radiator is of the vertical tube type, with Mercedes front, having sufficient capacity to maintain the fluid at the proper temperature under all conditions of service. Cooling is further aided by a six-bladed, pressed steel, ball bearing fan, driven by a flat belt and having a vertical slide adjustment.

Carburetion is by a double jet Stromberg, located on the left hand side of the motor, and provision is made for heating. The capacity of the fuel container located under the front seat is 14 gallons, and an auxiliary tank is fitted under the hood, an arrangement making it possible to surmount steep grades with a gravity system.

A constant level splash and circulation system of lubrication is employed, a gear driven pump actuated by the magneto shaft drawing the lubricant from the reservoir in the crankcase and forcing it through the dash sight feed, thence to the oil troughs. Distribution is so arranged that the level is constant regardless of road conditions. The capacity of the reservoir is 1.25 gallons and means are provided for

noting the supply of lubricant.

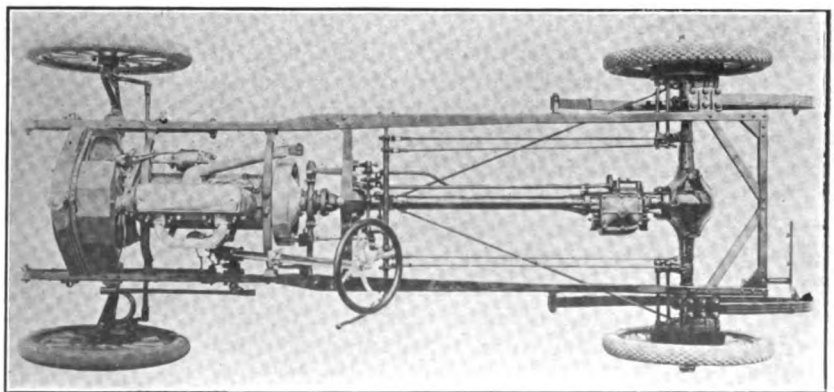
Ignition is by the Briggs dual system, the magneto being located on the right hand side of the motor and driven through a gear actuating the fan pulley. The system also includes six dry cells, a kick switch and non-vibrating coil, and a locking device. One set of spark plugs is utilized, these being in the cylinder head. The clutch is a leather faced cone, 15.75 inches in diameter, with eight adjustable springs, making for easy en-

gagement. Drive is through a Spicer universal joint back of the clutch and inside the torque tube ball to a nickel steel shaft 1.125 inches in diameter.

The transmission is located amidships, and is of the selective type, providing the conventional three forward speeds and reverse, with direct drive on the third. The rear axle is of the three-quarter floating type, and energy is imparted to the road wheels through bevel gear to 1.125-inch nickel steel shafts enclosed in seamless steel tubing. The differential housing is malleable iron, and a large sized inspection plate is provided. Hyatt high duty bearings are employed throughout. The construction of the rear axle is sturdy in every particular.

The frame is of carbon steel, .15625 inches thick and with a depth of channel section of 4.5 inches. The width of section varies from 1.5 inches minimum to three inches maximum, and the frame is inswept at the front, providing a short turning radius. A low centre of gravity is assured by the usual drop. Three cross members are employed.

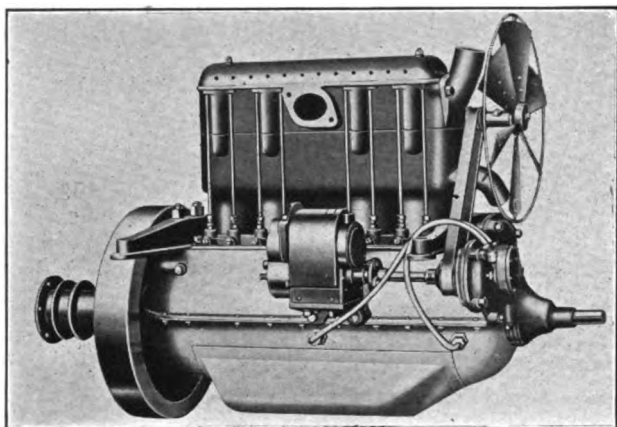
The front springs are semi-elliptic, 37 inches long and two wide, while the rear members are



Plan View of Partin-Palmer Chassis, Illustrating Simplicity of Design and Accessibility of Components.



three-quarter elliptic, with full quarter, 48 inches long and two wide. The material is oil treated steel, ground and polished, and self-lubricating



**Valve Side of Partin-Palmer Motor Having Novel Features, Including Overhead and Enclosed Valves, Removable Cylinder Head, Etc.**

bolts of ample dimensions are utilized.

The front axle is a drop forging of the I beam section type, having a depth of 2.5 inches and width of 1.5. The arms, knuckles and spindles are drop forged and the last named are large, insuring an ample factor of safety. The steering gear is of the worm and wheel type, and the column is set at 45 degrees and surmounted by an 18-inch wheel. Lubrication is by conveniently located grease cups. The spark and throttle levers are mounted in the usual manner. The maker calls attention to the steering wheel, stating that its position and arrangement of the front seat permit of the driver leaving and entering the car without difficulty.

The speed change lever is located in the centre at the right of the operator, who is seated at the left. The rocking type of lever is employed in a rectangular slot. The emergency brake lever is placed at the left. The clutch pedal is at the left, with service brake at right, with the usual accelerator between the pedals. Two sets of brakes are provided, both being of the internal expanding design. Both drums are turned to diameter after being bolted to the wheel, the service drum being 14 inches in diameter, with two-inch face, that of the emergency 10 inches diameter with 1.75-inch face. Both sets are equalized and easily adjusted for wear.

The wheels are of the artillery type, of carefully selected wood, and have 12 spokes. Good-year quick detachable, quick demountable rims with Goodyear 32 by 3.5-inch shoes are fitted as standard, although option is given of 33 by four-inch tires at the actual difference in cost. The

wheelbase is 115 inches, tread, standard, 56.

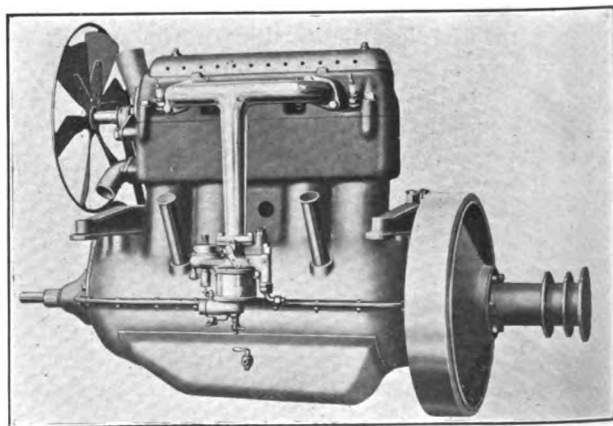
The body is aluminoid steel over a wooden frame, and ample room is provided for six passengers. Two auxiliary seats are fitted, these being 15 inches wide and measuring 14 inches from front to back. These have automatic catches for holding the legs when in service, and when not employed the entire assembly folds back under the front seat, out of the way. All doors are 20 inches wide, making for easy entrance and exit.

The upholstery is high grade and the cushions are deep and comfortable. The front cushions are 17 inches deep, while the rear is 19. The fenders harmonize with the attractive body lines, and the usual splash aprons are fitted, fully protecting the occupants from mud, etc. The body is painted blue black, with gray gear, and the fenders and hood are enamelled black.

Although gas and oil lamps are fitted as standard equipment, the company is prepared to install the Auto-Lite electric lighting and motor starting system at a very low cost. It can be fitted before or after purchase at option of the buyer.

The equipment of the Partin-Palmer includes a four-bow mohair top and envelope, enclosed curtains, clear and rain vision windshield, Stewart speedometer, Prest-o-Lite gas tank, black enamelled and nickel lamps, extra rim, rear tire irons, robe and foot rails, repair kit, tools, jack, horn, pump, etc.

Although the Partin-Palmer motor is rated at 38 horsepower at 2200 revolutions a minute, it is stated that it has developed considerably in ex-



**Intake Side of Partin-Palmer Motor, Showing Cylinders Cast En Bloc with Crankcase, Cone Clutch and Method of Suspension.**

cess of this in tests. This coupled with the extreme light weight provides ample power to meet all requirements of service.



## CONCERNING GOOD ROADS MATTERS.

**B**ECAUSE of the present widespread interest in good roads, it is anticipated that the third American road congress, which will be held in Detroit, Sept. 29-Oct. 4, will be one of the most largely attended meetings of this character that has been arranged in this country. The congress is to be held under the joint auspices of the American Highway Association, the American Automobile Association and the Michigan State Good Roads Association. The day's sessions will be held on the second floor of the Wayne Gardens, while the evening sessions and special meetings of the various organizations which will take part, will be held in the Hotel Pontchartrain and other hotels. A partial list of the papers which will be presented follows:

"The Labor Problem in Road Construction," Capt. P. St. J. Wilson, state highway commissioner for Virginia; discussion opened by W. E. Atkinson, state highway engineer for Louisiana.

"Systematizing the Purchase of Road Materials and Equipment," Henry G. Shirley, chief engineer state roads commission for Maryland.

"Unsurfaced Roads," W. S. Keller, state highway engineer for Alabama; discussion opened by George W. Cooley, state highway engineer for Minnesota.

"Gravel Roads, Their Construction, Maintenance, Cost and Special Treatment," Hon. S. Percy Hooker, state superintendent of highways for New Hampshire; discussion opened by H. L. Bowlby, state highway engineer for Oregon.

"Treatment of Worn Out and Ravelled Macadam Surfaces," Col. E. A. Stevens, state highway commissioner for New Jersey; discussion opened by Hon. Robert C. Terrell, state commissioner of public roads for Kentucky.

"Bituminous Macadam, Construction and Maintenance," S. D. Foster, chief engineer, state highway department of Pennsylvania; discussion opened by W. A. McLean, provincial engineer for Ontario, Canada.

"Brick Roads," James M. McCleary, county engineer for Cuyahoga county, Ohio; discussion opened by R. Keith Compton, chairman, paving commission, Baltimore, Md.

"Concrete Roads," Hon. Frank F. Rogers, state highway commissioner for Michigan; discussion opened by Paul D. Sargent, state highway engineer for Maine.

"Selection of Materials," Hon. Logan Waller Page, director, United States office of public roads.

"Drainage Structures," A. R. Hirst, state highway engineer for Wisconsin; discussion opened by Prof. T. H. MacDonald, state highway engineer for Iowa.

"California's \$18,000,000 State Highway System," A. B. Fletcher, state highway engineer for California.

"The Organization and Management of Working Forces," A. N. Johnson, state highway engineer for Illinois.

"Contract Law," William Bowman, New York City.

"The Protection and Upkeep of Road Equipment," Daniel J. Hauer, New York City.

"The Merit System in Road Management," Hon. J. A. McIlhenny, president, United States civil service commission.

"Financing Road Improvement," William G. Edens, president, Illinois Highway Improvement Association.

"Bond Issues for Road Improvement," S. E. Bradt, vice president, First National Bank, DeKalb, Ill.

"The International Congress and the Roads of England, France and Germany," Col. William D. Sohler, chairman, Massachusetts highway commission.

"Economics of Road Improvement," J. E. Pennypacker, secretary, American Highway Association.

"Dirt Roads and Politics," Charles P. Light, formerly state highway commissioner for West Virginia.

In addition to the papers to be presented, of which the above is only a partial list, there will be a comprehensive exhibit of road making materials and machinery, in which a large number of the manufacturers in the country will be represented.

In connection with this announcement, it is of interest to note that the office of information, Department of Agriculture, Washington, D. C., is issuing the following statement, under the head "A Large Part of Road Building Funds Wasted":

The office of public roads of the Department of Agriculture is making a strong effort to focus the mind of the country on the fact that maintenance and effective repair are of equal importance with the actual improvement of bad roads. Investment of money in new roads does not become real economy until provision is made for keeping these new roads in condition after they are built. If a new road was built and then allowed to fall into disrepair, much of the original investment is simply wasted.

Europe, generally speaking, is ahead of the United States in the matter of road improvement, but Great Britain is struggling with a problem similar to the one that confronts the people of the United States. In England, Scotland, and Wales there are no fewer than 2140 separate authorities, who, between them, administer 175,487 miles of roads, or an average of only 82 miles apiece. In Scotland, apart from the big cities, there are over 200 burghs, one-half of which have but 10 miles of road apiece to maintain. Needless to say, such a minute mileage is insufficient to keep the road plant fully occupied all the year around, and renders the employment of a skilled engineer impossible for economical reasons.

Officials of the office of public roads when called upon for assistance by the various states are pointing out that road building is an art based on a science, and that trained men and experienced men are necessary to secure the best results from the expenditure of road funds.

Statisticians have found that although the average expenditure on the improvement of roads exceeds \$1,000,000 a day, a large portion of the money in the United States is wasted because of the failure to build the right type of road to meet the local requirements, or the failure to provide for the continued maintenance of the improvement.

The various states and counties within the past six months have taken a greater interest in road improvement than ever before in the history of the United States, and there is now a strong movement to conserve the roads of the country where they are improved. Scientific maintenance will be one of the chief features of the work of the office of public roads throughout the present year.

The good roads committee of the Automobile Chamber of Commerce, which is now the representative organization of the automobile manufacturers in America, asks the question, "Are Macadam Roads Obsolete?" The question is answered by H. W. Perry, secretary of the committee, in the following manner:

In almost every annual report issued by highway commissioners in the last five years great emphasis has been laid upon the rapid destruction of the roads and the increasingly heavy cost of keeping them in even fair condition. The world famed road system of France is now in such a state that the government has recently appropriated a large sum for a general treatment of the sur-



faces with a tar binder. In both France and England road tarring has been widely practiced for several years. At the first international road congress, held in Paris in 1908, the delegates voiced their opinion that the water-bound macadam roads could not resist the destructive effects of automobile travel, and that if the use of this class of roads was to be continued some better way of binding the broken stone than by the cementing effect of stone dust and water must be adopted. The opinion was expressed that this probably could be effected by the use of tar or asphalt applied to the road surface or incorporated with the stone. In England and France they are spending fully three times as much money a mile for road maintenance as in this country, according to State Highway Commissioner Sohler, of Massachusetts, who recently returned from Europe, where he attended the third road congress and made a study of the foreign roads.

Regarding water-bound roads, the Rhode Island state board of public roads makes this statement in its annual report for 1912:

"We have learned from experience, as all the older states and countries engaged in modern road building have learned, the uselessness of trying to maintain this latter class of roads for any length of time with a smooth and even surface, where the motor vehicle traffic is very great, by the methods heretofore employed."

In support of this opinion the board cites a road that was resurfaced with new "metal" for a distance of four miles in the latter part of 1910 and watered and rolled thoroughly, yet which early in the following season of 1911 developed holes that multiplied to such an extent that they had to be cleaned out, refilled and coated with tar.

Nearly 60 per cent. of the state roads of Massachusetts have been treated with surface applications of bituminous material, or have been built with a tar-macadam surface. "Our commission decided some five years ago," writes Chairman Sohler, "that where there were more than 100 motor cars a day water-bound macadam roads or gravel roads required either oil or tar, or something to prevent their being torn up and ravelled, also that in constructing new roads we should construct more permanent pavement than water-bound macadam, and we have been using both tars and asphalts in the top three or four inches of the road."

During the year 1911 the Massachusetts highway commission spent more than \$500,000 in the maintenance of state highways, of which more than \$300,000 was obtained from automobile fees. Yet in the last annual report the commissioners say:

"It now seems to the commission that a surface coat of asphaltic oil would not prove to be economical or satisfactory on a road which has a large amount of heavy teaming, though it is satisfactory, or has been up to the present time, on roads which have a large amount of high-speed automobile travel, with but few heavily loaded teams."

So after all, it is not automobile travel that does all the damage, although the observations of many road authorities on the subject undoubtedly leave that impression.

While oiling of the roads is effective in laying dust and helping to preserve the surface, if repeated periodically, it does not prevent destruction or very greatly reduce cost of maintenance. A recent inspection of some of the bituminous roads of Rhode Island shows that some of those between Providence, Fall River and Bristol which were surfaced from two to five years ago are in poor condition today and are undergoing resurfacing and extensive patching.

Travel on all state roads throughout the country is increasing at a tremendous ratio, as shown by traffic censuses taken in different places. It is undergoing a great transition, also, and it is apparent to any observer that in the next 10 years the predominating traffic will be motor driven in many states. Yet what is the condition of affairs in highway work as revealed by reports of highway commissions?

During the year 1912 we find that in nine leading states having state highway departments there were built or contracted for 658.75 miles of water-bound roads at an average cost of \$7765, and 1122.5 miles of bituminous macadam at an average cost of \$8948 a mile; also about 200 miles of gravel roads. These may all be designated impermanent roads, because under the probable increase of traffic their surface will not have a life of more than

five to 10 years—probably much less in most cases. As compared with this total of 1981 miles of impermanent roads, the same states built or contracted for a total of only 581 miles of other roads, of which 62.75 were brick at \$14,623 a mile, 114.5 cement concrete at \$7395 a mile, 55.5 asphalt on concrete base at \$16,643 a mile, 6.5 asphalt on macadam and 342 miles of types not designated.

How many miles of the undesignated roads were of permanent construction is not known, but if they were all of this type, there would be only 581 miles of permanent roads, as compared with 3.3 times as many miles of impermanent new macadam.

The states from which the foregoing figures are obtained are Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Maryland, Ohio and California. Other states are much less advanced than these in the matter of permanent road building.

The point it is desired to emphasize is that, while admitting the unsuitability of water-bound macadam to present day traffic conditions, the most advanced states in highway work continue to spend great sums of money in building more such roads, and, while condemning the automobile and motor truck as the most destructive agencies, they tax the owners of these vehicles more heavily than any other class of citizens and road users for their construction and maintenance. In other words, they take our money through state aid laws to make roads that are not suitable for automobile traffic and then tax us heavily in the form of registration and license fees for the use of these roads in order to raise a fund to repair damages they allege the cars and trucks do to them!

It is up to the motor vehicle owners, under the circumstances, to demand the building of permanent highways instead of the obsolete macadam roads. Road commissioners say to this that it is impossible to raise the necessary funds to pay for the more expensive permanent roads. The obvious answer to this assertion is that, if unavoidable, build fewer miles of new road, but let them be of some permanent kind that will suit traffic conditions—not only of today, but of the next 25 years.

However, a better way has been suggested by S. D. Waldon, formerly a member of the good roads committee of the Automobile Chamber of Commerce.

"My opinion is," he says, "that there should be only two kinds of roads built in the country: concrete and gravel. Concrete is the last word in efficient and durable surface at not too great a cost, and gravel the best farmer's road at the minimum expense. I think it is a waste of time to build roads of anything better than gravel and not as good as concrete."

Gravel roads cost only a fraction of the cost of macadam roads, and the saving that can be effected by building one mile of gravel road instead of macadam on the less travelled roads would more than pay the difference in cost of building one mile of concrete road instead of macadam.

In fact, records prove that concrete roads cost not to exceed 50 per cent. more than water-bound macadam and about the same as tar macadam. The cost of concrete in Cuyahoga county, Ohio, was \$603.34 for each foot in width one mile long, as compared with \$577.45 for water-bound macadam and \$885.30 for tar macadam. Those in Wayne county, Michigan, cost \$838.03 a foot a mile, as compared with \$862.75 for water-bound macadam in Maryland. Experimental road sections laid in Ohio by the state commission cost \$340 a foot for ordinary macadam, \$497.24 to \$651.98 for tar macadam and \$507 a foot for gravel concrete.

When properly laid, the concrete road is entirely successful, as is proved by the 65 miles that have been built in Wayne county. The cost of upkeep is almost nothing—less than \$100 last year on the whole 45 miles in Wayne county and not exceeding \$150 in 21 years on half a mile of concrete streets laid in Bellefontaine, O., in 1891-2.

No patented process or patented materials are required in making concrete roads; they are dustless and mudless, smooth, level, sanitary and self-cleaning, the rains washing the surface. The saving in maintenance alone will in a few years repay the excess of first cost over macadam. All large cities are now using concrete as a base for brick, asphalt, wood block and other street pavements.

Let the motor car interests unite in demanding permanent roads and urge that particular study be made of concrete as the most suitable material for their construction.



### SECURES HANLON PATENT.

#### Anderson Electric Car Company Purchases Entire Window Rights.

After many months of negotiating, the Anderson Electric Car Company, Detroit, maker of the Detroit electric line of cars and trucks, has purchased the entire rights in the Hanlon patent for electric car windows. This invention is held to cover the basic principles of the clear vision type of window, and the Anderson company secures control in America and abroad.

The features of the Hanlon window are held to be that of protecting the occupants of the machine from undesirable weather, and at the same time to enable the driver to see ahead clearly at all times. Adjustable from within, the operator may incline the front window to any desired angle, and in the event of rain, snow or heavy dust it may be closed from within in such manner that the storm will not beat against the front glass. When closed in very cold weather, it is maintained that it is impossible for frost to form on the glass. It is announced that this is but one of a number of new features which will be incorporated in the 1914 Detroit electric line.

### STUDYING CYCLECAR FIELD.

#### Francis R. Hoyt Has Been Engaged as Consulting Engineer by Ohio Men.

Francis R. Hoyt, Cleveland, O., a consulting engineer of wide acquaintance in the motor car industry, is engaged in an investigation of cyclecar development for a group of Ohio business men, whose identity is withheld for the present. The purpose of the inquiry is to analyze fully the mechanical features of the cyclecar and small car as they have been evolved in foreign practice, with such modifications as are necessary to meet American conditions.

It is expected that the report will show the best design to incorporate in a vehicle of the cyclecar type, which will be light in weight and simple in construction, but sturdy enough for high speed and poor roads, capable of going 45 miles on a gallon of gasoline and of making 40 to 50 miles an hour. It also is intended to design a monocar along somewhat novel lines, for light delivery service, which will be capable of carrying 400 to 500 pounds exclusive of the driver.

In this connection it is of interest to note that Mr. Hoyt is responsible for the production of a novel small car, an exact half-size model of John

Aitken's famous National racer No. 4, constructed for Master Tom Hoyt in 1910. This little machine, complete to the last detail, is driven by a small electric motor, with clutch and two brakes, and with dummy shifting lever. It is capable of making six miles an hour, and has been found to be a decidedly practical toy automobile.

### BECOMES VICE PRESIDENT.

#### Alvan Macauley Adds Duties of That Office to Those of General Manager.

Alvan Macauley, general manager of the Packard Motor Car Company, Detroit, maker of Packard pleasure cars and commercial vehicles, has been made a vice president of the concern, his title now being vice president and general manager. Mr. Macauley has been identified with three concerns, each of which occupies a commanding position in its field.

Trained in the legal profession, he developed a grasp of large business affairs as patent counsel for the National Cash Register Company, Dayton, O. In 1901 he became identified with the American



Alvan Macauley, Vice President  
Packard Motor Car Company.

Arithometer Company of St. Louis, Mo., and was instrumental in its removal to Detroit, where it became the Burroughs Adding Machine Company.

### FORMS MARTIN TRACTOR COMPANY.

#### Concern Has Exclusive Rights Except for Knox Automobile Company.

The Martin Tractor Company, Springfield, Mass., with a capital stock of \$350,000, is a new concern in the commercial vehicle field, having been formed with the following officers: President, Harry G. Fisk; vice president and general



manager, C. H. Martin; treasurer, E. O. Sutton; secretary, C. E. Beckwith.

One of the largest stockholders is S. S. Evland of Philadelphia. Aside from the Knox Automobile Company, also of Springfield, which enjoys the right to manufacture this product under the style of Knox-Martin tractor, the new company has exclusive rights under Mr. Martin's patents, with the privilege of issuing sub-licenses to other manufacturers.

### NEWSOM GOES WITH KEETON.

#### Well-Known Executive Assumes Important Duties with Detroit Concern.

H. H. Newsom, formerly manager of the McCord Manufacturing Company, and later



H. H. Newsom, Manager, Keeton Motor Company.

occupying the same position with the Hayes Manufacturing Company, has been appointed manager of the Keeton Motor Company, maker of Keeton cars. All of these companies are located in Detroit. Mr. Newsom is well and favorably known as an executive of successful industries his tenure of office with the Mc-

Cord and Hayes companies witnessing a marked growth for both concerns.

Mr. Newsom will relieve Vice President Keeton of much of the detail of the Keeton company's affairs. Mr. Keeton is also president of the Keeton Motors, Ltd., Brantford, Can., and this move will permit him to give more of his time to the affairs of the Canadian company. Preparations are being made for an immediate enlargement of the manufacturing facilities of the company, and an increase in the output for 1914 of about 3000 cars.

Mr. Newsom is a graduate of the mechanical engineering department of the Purdue University. He entered the automobile industry in its earliest stages and specialized in gas engines. He was

connected for a few years with the power department of the Chicago & Northwestern railroad. He was the first secretary of the Wolverine Automobile Club, Detroit, to which position he was twice elected.

### TO MAKE DODGE CAR.

#### Understood That Dodge Bros. Will Sever Its Connection with Ford Company.

Dodge Bros., Detroit, manufacturer of automobile engines and parts, will sever its connection with the Ford Motor Company, Detroit, on June 1, 1914, according to reports, and in the meantime the concern will begin the manufacture of automobiles of the Ford type, to be called the Dodge car. The two brothers, John and Horace E. Dodge, began with Henry Ford when the Ford plant was in its infancy, their original investment being about \$10,000.

It is said that the Dodge brothers have drawn considerable money in dividends from the Ford plant, besides making a good profit annually in their own business. Last year Dodge Bros. furnished the Ford company with engines and parts valued at \$10,000,000, according to a statement issued in Detroit.

### TAKES OVER MARATHON SALES.

#### Herff-Brook Corporation Organized in Indianapolis to Handle Entire Product.

The Herff-Brook Corporation has been incorporated under the laws of Indiana with a capital of \$100,000, to handle the output of the Marathon Motor Works, Nashville, Tenn. The offices of the new concern will be maintained at Indianapolis, Ind., and the sale of Marathon cars will be controlled throughout the United States. Branch agencies will also be established in foreign countries. According to present plans of the incorporators, eight men will be immediately placed in the field to organize agencies, and the export business will be put in competent hands.

The officers of the Herff-Brook Corporation are: President, Jacob Herff; vice president, Herbert Herff; treasurer, George Herff; secretary and sales manager, H. H. Brook. The last named has been with the Marathon company for several years as general sales manager. All are experienced automobile men. Treasurer Herff has been manager of the State Auto Company for five years, and with him has been associated his brother, Herbert Herff, in handling Marathon cars in Indianapolis.



## PURCHASES WARREN PLANT.

### Rands Manufacturing Company Will Add It to Present Holdings in Detroit.

W. C. Rands, of the Rands Manufacturing Company, Detroit, has purchased at auction the complete factory, grounds and machinery of the Warren Motor Car Company, Detroit, for \$120,000, increasing his bid of \$104,600 at a former sale, which was ordered void by the court for technical reasons. The Peter Smith Heater Company was the only opponent of Mr. Rands, but it ceased bidding after offering \$119,000. Mr. Rands made the purchase with the object of giving Detroit the leading concern in the world in the accessory manufacturing field. At present the Rands Manufacturing Company has a large plant at 69-89 East Fort street, and a second large factory directly opposite the main plant. The Warren factory will be third to be utilized.

The two factories on Fort street have 90,000 square feet, while the Warren plant possesses 73,000 square feet. As the purchase included two acres of land, on which there are no structures, Mr. Rands plans to add buildings to practically cover the entire space. This will enable the company to more than double its present business, and when it is known that during the last year the output of this concern was 150,000 windshields and 75,000 automobile tops, it will be seen that this increase means considerable.

To the line already manufactured will be added other specialties, including steering wheels, lamp brackets, top irons, tire irons and many other accessories and parts for the automobile trade. At present the company employs between 400 and 500 men, but with the addition of the new plant the force will be more than doubled.

## WILL HANDLE SALES END.

### Bump and McNab Assume Important Positions with J. I. Handley Company.

Following the formation of the J. I. Handley Company for the purpose of distributing the product of the Marion Motor Car Company, and the American Motors Company, both of Indianapolis, Ind., makers of Marion and American cars, President J. I. Handley announces that he has associated with him F. R. Bump, who becomes general sales manager. With the acquisition of Mr. Bump the new Indianapolis concern has acquired the services of one of the best-known men in the automobile industry.

Mr. Bump graduated from Cornell University in 1896 and entered the bicycle business at the completion of his course. He was identified with several of the largest concerns in the country until 1904, when he became associated with the H. H. Franklin Manufacturing Company, Syracuse, N. Y. Within one year he became general sales manager of that company and built up one of the strongest sales organizations in the country at that time. He later became assistant general manager of the R-C-H Corporation, Detroit, at the time of its organization, and has remained there until the present. He has become acquainted with distributors and dealers all over the world, and automobile authorities look for his continued success with the Indianapolis firm.

In connection with Mr. Bump's appointment comes the information that Dr. M. D. McNab will assume the position of director of sales for the Middle West, with headquarters at Chicago.



F. R. Bump, General Sales Manager, and M. D. McNab, District Sales Director, J. I. Handley Company.

Dr. McNab is vice president of the Marion Motor Car Company, and this move will in no way affect that office. He also is well known in the sales end of the industry, having been manager of the Chicago branch of the Maxwell-Briscoe Motor Company for a number of years, and later acting in the same capacity for the United States Motor Company. He is said to know 90 per cent. of the dealers in his district, which will include northern Illinois, northern Indiana, and all of Wisconsin and Iowa.

W. S. Jewell, well known to many in the automobile industry, will have charge of the metropolitan district, with headquarters in New York City, which includes parts of New York, New Jersey and Connecticut. He also has been elected vice president and general manager of the American-Marion Sales Company of New York.



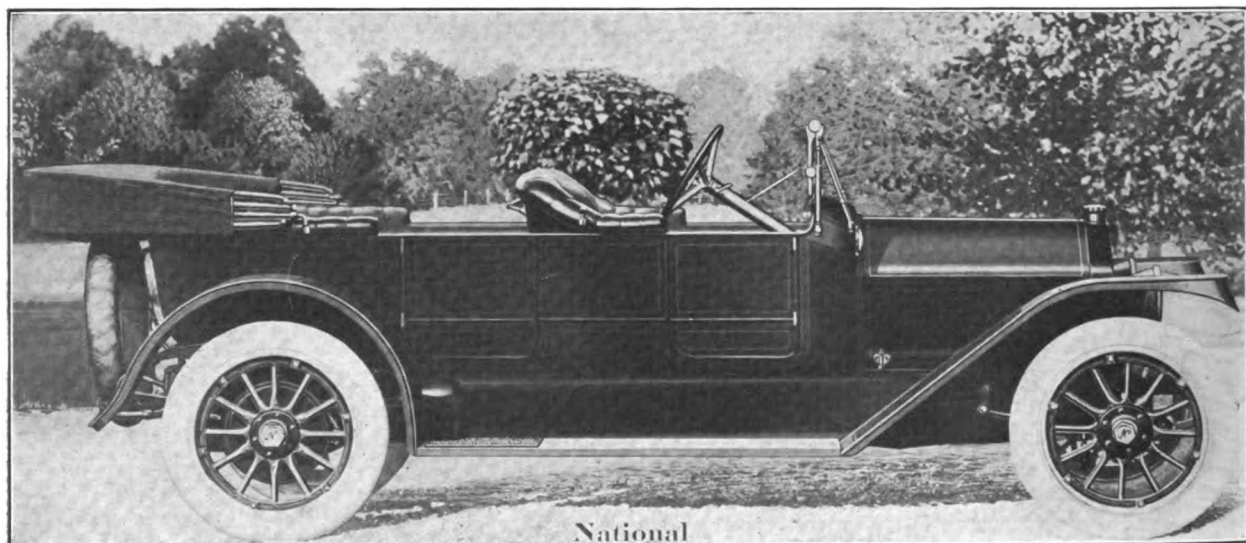
## NATIONAL ANNOUNCES NEW SERIES V-3.

**A**DHERING to its policy of presenting a new series as a result of greater study, experience and manufacturing efficiency, without regard to the season or calendar date, the National Motor Vehicle Company, Indianapolis, Ind., maker of National cars, is announcing its series V-3. This comprises five models, including five and seven-passenger touring, four-passenger toy tonneau, two-passenger speedway roadster and two-passenger semi-racing roadster. All are fitted with the Gray & Davis electric motor starter and lighting system, and the balance of the equipment is very complete, every convenience being provided.

The new series is a continuation in general of

cated on opposite sides and are actuated by camshafts driven by spiral cut timing gears. The valve stems and springs are completely enclosed, eliminating noise and protecting the mechanism from the abrasive effect of road dust. The crankshaft is ample in size, of vanadium steel ground to one-thousandth part of an inch, and provided with extra long bearings. The aluminum crankcase is horizontally divided, and all interior components of the power plant are very accessible.

Carburetion is by an 1.75-inch Rayfield hot water jacketed carburetor on all models, with the exception of the roadster, which is fitted with a two-inch, although option of a Schebler is given. Dash control is standard. Pressure feed of fuel



**National Series V-3 Five-Passenger Touring Car, Having Four-Cylinder Motor, Extra Roomy Body, Luxurious Upholstery and a Complete Equipment.**

the former series and the same high grade material and workmanship for which the product of the company is noted, makes for a quality car, one having ample power and speed as well as durability, reliability and efficiency under all conditions of service. The reliability of the National product has been amply demonstrated in track and road contests and the company points with pride to its world's stock car championship and the record made in the 500-mile Indianapolis race, which mark still stands.

The series V-3 chassis has a four-cylinder motor with a bore of 4.875 inches and stroke of six, with the cylinders cast in pairs and thoroughly annealed. The valves are mechanically operated, interchangeable, and have large nickel steel heads. The intake and exhaust members are lo-

is employed, the proper pressure being maintained by a small pump in the crankcase. The two sets of spark plugs are located in the valve caps in the cylinder heads and current is supplied by a gear driven high-tension dual double Bosch magneto with a storage battery in reserve. As in the past, the use of packing is eliminated, tapered nipples being utilized on the intake, exhaust and water pipes, a construction preventing opportunity for leakage. Integral with the motor is a tire pump.

The lubrication system is of the constant level, force feed type, a gear driven pump feeding oil to the bearings and cylinders. The capacity of the crankcase is four gallons. A pressure feed is utilized on the roadster, a 10-gallon container being mounted on the rear deck.



Cooling is by a centrifugal pump and the system has a capacity of six gallons. The radiator is a special straight line type, mounted on trunnions to prevent damage through vibration. Cooling is assisted by an adjustable, belt driven, ball bearing fan attached to the motor base. Brass outlet tubes are employed and the radiator cap is of notched hard rubber. The filler is of ample length. The efficiency of the cooling and lubrication systems of the National has been amply demonstrated in speed contests.

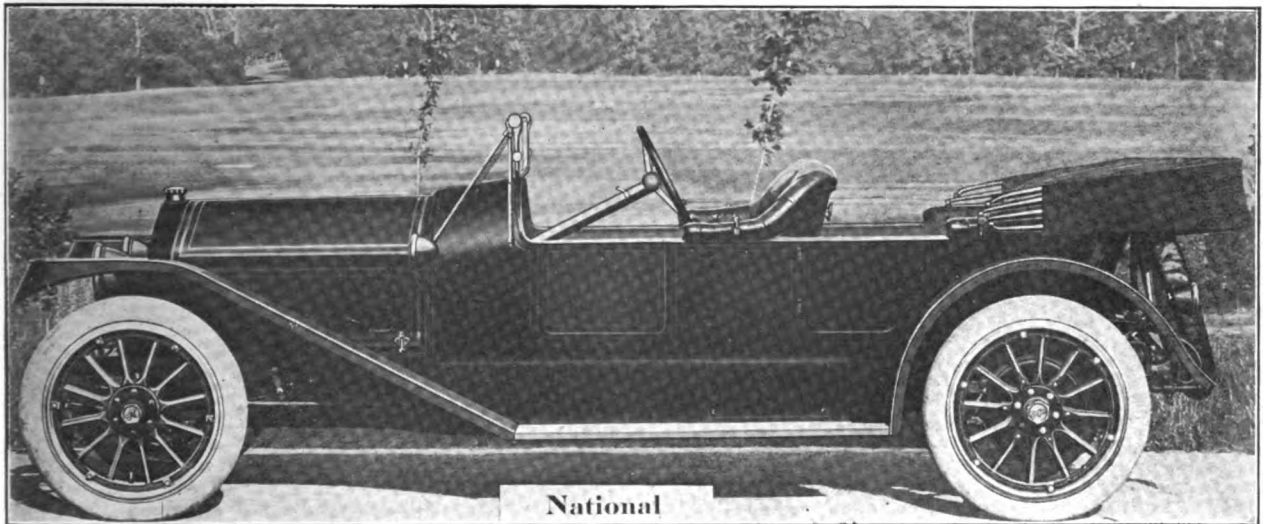
The clutch is a self-contained, leather faced aluminum cone, spring cushioned to give gradual but positive engagement, and is removable without disturbing the transmission. The clutch operates smoothly, and an efficient clutch brake makes changing of gears an easy matter.

The transmission is of the selective type, af-

umn is set at a comfortable angle and is surmounted by an 18-inch wheel. The steering gear is of the worm and gear type and ball connections are employed to the steering knuckle.

The springs are semi-elliptic front and three-quarter scroll elliptic rear. The frame is of pressed steel, wide flanged, five-inch channel section on all models except the roadster, which is 4.5, firmly riveted and braced, and having a kick-up at the rear. No sub-frame is utilized. The wheelbase of the touring models is 128 inches, that of the speedway roadster, 120. Both the front and rear mudguards are of the wide and continuous type. Metal dust shields between the frame and running boards further protect the passengers and also serve to conceal the tool box. Shields are fitted over the rear spring shackles.

The bodies of the new series are of sheet



**National Four-Passenger Toy Tonneau, Having Attractive Lines, Left Hand Drive and Centre Control.**

fording three speeds forward and reverse. The gears are of chrome nickel steel, oil tempered, and annular ball bearings are utilized, these running in oil. Drive is by bevel gear through straight line shaft with double universal joints and torsion member. The front axle is of the I beam section type, a one-piece steel forging. Large adjustable roller bearings are utilized in the wheel hubs also at the top of the yokes. The rear axle is of the full floating type.

Two sets of brakes are provided, the service members being of the internal expanding type operated by pedal, while the emergency members are external contracting. Both are located on the rear wheels, the drums of which are 16 inches in diameter, of a one-piece pressed steel secured by 12 bolts. The driver is located at the left with right, centre control. The steering col-

metal, low and extra roomy, having wide doors and entrance at either side. They are noticeable for their straight and attractive lines, and the upholstery is unusually deep and comfortable, with special deep Turkish cushions. A concealed, but readily accessible baggage carrying compartment is provided under the front seats of the touring models.

Firestone demountable rims with one extra member are standard equipment, which also includes in addition to the electric motor starter and lighting system, top, cover and curtains, ventilating, rain vision windshield, Truffault-Hartford shock absorbers in the rear, electric horn under hood, Gray & Davis 12-inch black and nickel bullet headlights, insert dash lights. Gray & Davis six-inch black and nickel side lights are fitted to the toy tonneau and speedway roadster.



## NEW AND NOVEL ACCESSORIES THAT APPEAL TO MOTORISTS

**Cello Dashlight.**

The law regarding the speed of a motor car is enforced at night as well as in the daytime, and unless the car is equipped with an electric lighting system, including a speedometer light, it is difficult to utilize the speed indicator to advantage. The A. S. Campbell Company, Atlantic avenue, Boston, is marketing an inexpensive dashlight for speedometers, and a feature of the device is that it is operated on one standard dry cell. It comprises a standard or bracket for mounting on the dash over the speedometer dial or other indicating device, also a hooded reflector. The lamp is a powerful tungsten bulb, requiring but a small amount of current to operate, and incorporated in the dashlight proper is an ingenious switch. The Cello is well and sturdily constructed, heavily nickel plated, and a sufficient length of high-grade cord is included in the equipment. The Cello is guaranteed as represented.

**Apco Ford Oil Filler.**

The Auto Parts Company, Providence, R. I., maker of Ford specialties, is marketing the Apco combination breather pipe and oil filler for model T Ford automobiles. It is constructed to replace the usual filler cap and has the advantage of possessing a large top, making the replenishment of the supply of oil an easy task, even in the dark. The design of the filler is such that any mist from the crankcase is prevented from soiling the exterior of the engine. A strainer is incorporated in the filler, preventing the entrance of any foreign elements that may exist in the lubricant. The device is made of cast aluminum, with polished hinged cap, and is moderately priced.

**Basline Autowline.**

The Edwards Manufacturing Company, Cincinnati, O., is marketing the Basline Autowline, which differs from the conventional devices of this nature in that instead of a rope a yellow strand wire member is utilized. This steel wire is but .25 inch in diameter, and it is stated that it can pull a 4000-pound car up a 20 per cent. grade. The complete equipment weighs but five pounds and it may be coiled up compactly and placed under a seat. The Autowline may also be employed to extricate a car from deep mud or a rut by attaching it to the wheel and hub, using the latter as a capstan, the other end being secured to any stationary object at the roadside.

**Boston Combination Grease Gun.**

One of the advantages of the Boston combination grease gun made by the Randall-Faichney Company, Boston, is that it is adaptable for handling gasoline as well as light or heavy oils and greases. When oils and

light greases are being employed, the Boston is used as an ordinary grease gun. For heavy greases, a lock nut is screwed down firmly and the T handle rotated, which movement forces the piston forward on a heavy square screw thread. The grease is forced out in ribbon form, which, it is stated, packs the gearcase, transmission, differential, etc., much better and more quickly than with ordinary guns. The Boston comes in various sizes ranging from three to 18 ounces capacities, and the equipment includes oil and grease tip and plug for closing. The finish is brass, lacquered.

**B. R. Shock Absorber.**

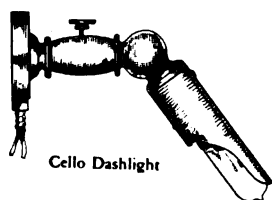
The B. R. shock absorber is marketed by the Lattig & Townsend Sales Company, 1431 Spring Garden street, Philadelphia, and it is claimed that both the compression and recoil of the car spring is compensated for. It is also stated that the absorbers require no attention or adjustment after installation. The B. R. device is of the clock spring type, the same width as the car spring, has six turns spaced .25-inch apart between convolutions, and is six inches in diameter. The absorber is placed under the top mainspring, and the top and bottom bolts are inserted through the shackle. A centre bolt is then placed between the slotted portion of the shackle and suitable clamps secured, as outlined in the illustration, to prevent shifting of the spring and to care for the rebound.

**Kemco Fan Type Dynamo.**

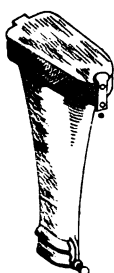
A novel installation of a lighting dynamo is noted in the Kemco, produced by the Kouyoumjian Electric & Manufacturing Company, Cleveland, O. It is a combination dynamo and fan, and replaces the ordinary fan. It is driven by a belt in the conventional manner, comes ready for attachment and is installed by removing the fan. It is stated that the size is such that it may conveniently be placed between the radiator and cylinders. With the motor operating the dynamo generates current for charging the storage battery, which may be employed for lighting and starting purposes.

**Endura Sheet Packing.**

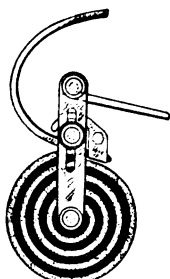
The Endura Manufacturing Company, Philadelphia, has brought out a new form of sheet packing which is made especially for service with hot or cold water connections, oil, gasoline, coal tar, etc. Endura packing is a vegetable fibre chemically treated, and having exceptional tensile strength will withstand a very heavy pressure without giving. It cuts very easily, is light in weight and is held to be as tough as rawhide. It is further claimed by the maker that the wetter it is the tougher it gets. One of the features of Endura is its light weight, making for economy, as it is sold by weight.



Cello Dashlight



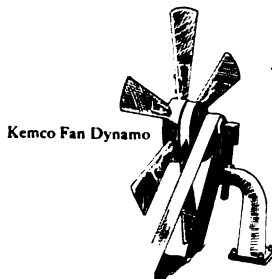
Apco Oil Filler



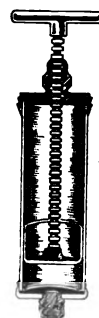
Basline Autowline



B. R. Shock Absorber



Kemco Fan Dynamo

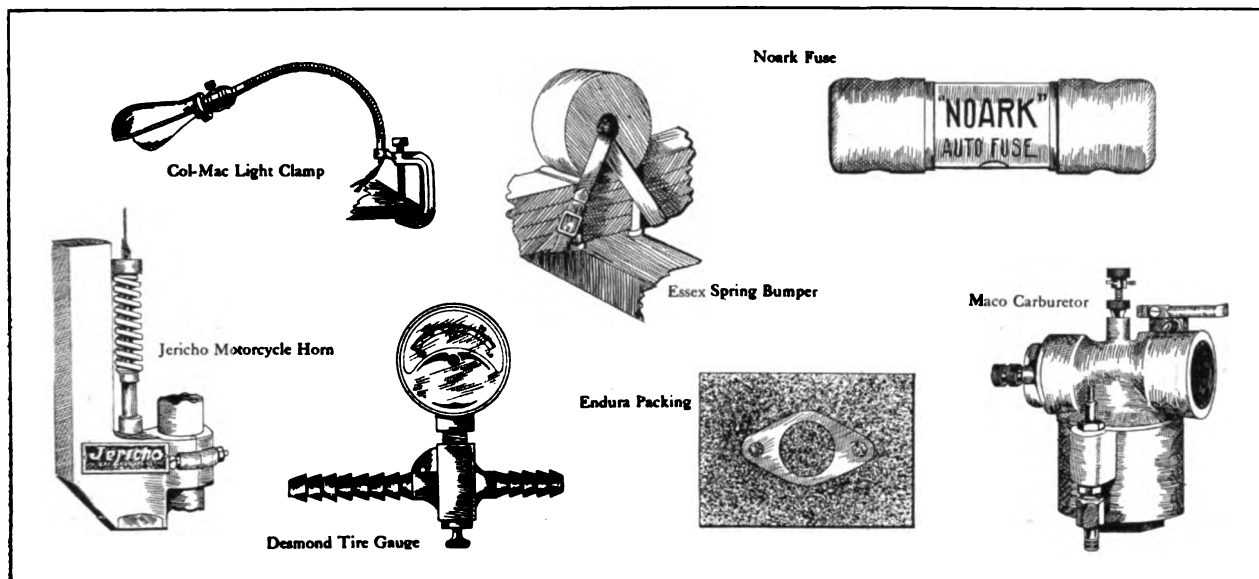


Boston Combination Grease Gun



R. C. W. Master Vibrator





It comes in sheets 41 inches square and .0625 and .125-inch thick; also in rolls 41 inches wide, in thicknesses of .015625 and .03125-inch.

#### R. C. W. Master Vibrator.

The R. C. Wells Manufacturing Company, Fond-du-Lac, Wis., is marketing a master vibrator termed the R. C. W. It is designed for synchronizing the spark of multi-cylinder motors, and may be employed with batteries and a low-tension magneto, or both. By its use separate vibrator adjustments are eliminated and the operation of the engine is improved considerably through accurate timing of the spark. The vibrator comes in a neat mahogany case with a neat, substantial kick switch and a removable plug for locking the ignition.

#### Col-Mac Light Clamp.

The Breeze Carburetor Company, Newark, N. J., has brought out a new device termed the Col-Mac flexible electric arm clamp, which presents practical features in that the light may be positioned as desired. It comprises an arm which carries at one end the shaded electric bulb, and at the other a detachable, adjustable clamp device. The clamp, which is of manganese bronze, has a three-inch clearance, and is equipped with a washer and screw stem, enabling it to be held securely on the work bench, lathe, running board of the car, etc. It is stated by the company that the arm may be bent to any desired position; that it will remain as placed until altered, and that it is not affected by constant use. The arm is firmly connected to the clamp by screwing into a boss on the side, through which, and the arm, the electric cord is drawn up to the lamp socket. The flexible electric arm and clamp comes in several styles, including a polished brass finish with 12-inch arm, 15 feet of cord and an oval shade, also a seven-inch parabola shade, and polished nickel, oxidized copper or bronze black finish. The arm referred to above is made in various lengths to meet individual requirements and installations.

#### Essex Spring Bumpers.

The Essex Rubber Company, Inc., Trenton, N. J., is manufacturing the Essex rubber spring bumpers, which are made in two forms, round and oblong. They are designed to be attached to the top leaf of the lower half of the car spring, and to prevent undue compression of the spring when the wheels encounter obstacles. The bumpers are secured by special straps, and it is held that they are very durable, being made of a high-grade rubber. They are made in three sizes, small, medium and large, the width being 1.5, 1.75 and two inches, respectively. They are moderately priced.

#### Noark Enclosed Fuse.

The H. W. Johns-Manville Company, Madison avenue and 41st street, New York City, is marketing a special fuse for service with electric lighting outfits. It is termed the Noark, because there is no arc or flash in the event

the fuse blows out, as the fuses are designed to do when a predetermined voltage is exceeded. This protects the lamps, etc. The Noark fuse is of the enclosed type, and in the event of its blowing, danger of fire igniting gasoline vapor is eliminated. The fuses are very compact and all working parts are gauged to a 10,000th of an inch to insure reliability of operation. They are constructed in various forms.

#### Maco Carburetor.

Maximum efficiency with a minimum consumption of fuel and simplicity of design are features emphasized with the Maco carburetor, manufactured by the Gleason-Peters Air Pump Company, 225 Classon avenue, Brooklyn, N. Y. There are but two adjustments, the fuel for low speed and the auxiliary air for high speed. The float chamber of the Maco is radial, enabling its being placed in any convenient position for attaching the fuel line, and the spraying nozzle is directly in the centre, insuring a constant fuel level at all times. The venturi tube in the constant air supply is so placed as to create a strong suction just above the point of the spraying nozzle, insuring the breaking up of all particles of fuel. The needle valve adjustment is on the top of the carburetor, a convenient location, and it is stated that being inserted in the top of the spraying nozzle, it spreads the fuel, greatly assisting in its vaporization. Leaks are also avoided by the arrangement. It is claimed that a perfect mixture is obtained automatically at any degree of speed. It is adapted for two as well as four-cycle engines. The Maco is constructed in several styles to meet the requirements of the motor, and in standard sizes.

#### Desmond Back Pressure Tire Gauge.

The Chicago-Racine Aluminum, Brass & Iron Works, 230 West Huron street, Chicago, is manufacturing the Desmond back pressure tire gauge, which is adapted for service with power and hand tire pumps. It is incorporated in the hose line between the source of supply and the tire, and the pressure in the tube may be taken instantly by pressing a small button. This indicates the amount of air by a hand on a calibrated dial. It also prevents further entrance of the atmosphere until desired by the operator. The gauge is very compact, well constructed and inexpensive.

#### Jericho Motorcycle Horn.

The Randall-Falchney Company, Boston, is marketing the Jericho motorcycle horn, which embodies the same quality of workmanship, material and efficiency as the Jubilee and Jericho horns made by this concern for automobile use. It is attached to the exhaust pipe between the motor and the muffler, the operation involving but little labor. Suitable fittings are supplied with each horn, which is operated by a metal cable. It is stated that the Jericho motorcycle horn has a penetrating, far-reaching, mellow tone, is positive in its action, and requires no attention after installation.



#### Standard Battery Connector.

In wiring dry cells, either in series or multiple series, it is important that the connections be tight if maximum efficiency is to be secured from the batteries. The Fitzgerald Manufacturing Company, Torrington, Conn., is producing a new design termed the Standard battery connector, which is constructed to grip the locking nut or terminal of the cell, and it is stated that the nuts will not jar or work loose. The company also manufactures another design with which locking nuts are not necessary. It is attached by simply springing apart the terminal loops, which when released grip the post.

#### Red Seal Dry Battery.

In these days of magneto ignition the motorist is prone to neglect the dry cells utilized for starting or as an auxiliary. As these members are only occasionally employed it imperative that they be of serviceable quality and not subject to deterioration. The Manhattan Electrical Supply Company, 17 Park Place, New York City, is the maker of the well-known Red Seal dry cells, which are especially designed for ignition systems in motor car, motor boat, etc. The maker states that the Red Seal cell will show a greater amperage after service than any other form and that it does not deteriorate by standing idle. It is made both in round and square cartons and each of these is produced in three sizes to meet the requirements of service. The square type is placed in a box of non-conductive material to prevent the pos-

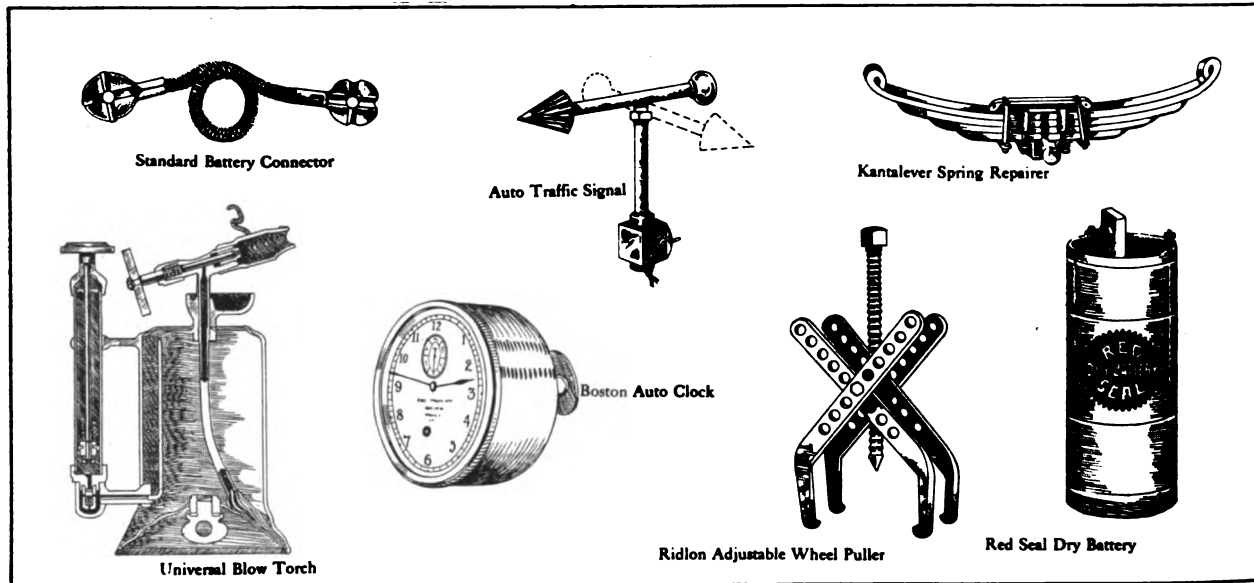
removing any deposits when the valve handle is turned. The handle of the valve is provided with fibre which does not get hot or require a long stem for cooling, as does an iron handle.

#### Boston Auto Clocks.

The Boston Clock Company, 16 State street, Boston, is marketing a line of high-grade automobile clocks, one of which, the model C, is shown in an accompanying illustration. One of the features of the timepiece is that it is adjustable to various angles by a ratchet and nut arrangement located at the back. The design of the clock approaches makes of speedometers, being very neat in appearance. It is an eight-day timepiece, having seven jewelled escapements, Breguet hairsprings, cut steel pinions, compensation balances, dust and water proof cases, etc. It is made in three sizes, having three, 3.5 and four-inch dials. An outside patented stem-winding and stem-setting device is listed as slightly extra.

#### Kantalever Emergency Spring Repairer.

It is decidedly inconvenient to be caught on the road some distance from home with a broken spring. While temporary repairs may be effected with blocks, etc., considerable care must be exercised in the operation of the car. The Motor Car Equipment Company, 55 Warren street, New York City, is marketing a practical device called the Kantalever emergency spring repairer, which, when applied properly, is stated to be able to sustain a



sibility of short circuits where the cell is subject to considerable vibration.

#### Auto Traffic Signal.

The Fawkes Auto Company, Minneapolis, Minn., is manufacturing the Auto Traffic signal, which is designed for attachment to the front or rear of the car, or both. It comprises a form of rotating arrow, the head of which is electrically illuminated. It is operated by a small lever on the steering column connected up with a steel rod which passes under the hood and which is furnished with drop-forged universal joint connections. By it the operator of the machine is enabled to signal an approaching vehicle, also to warn those in the rear of the direction to be taken by the car upon which it is fitted. The signals are furnished in black and nickel and are supplied for any make of car.

#### Universal Blow Torch.

The Westinghouse Electric & Manufacturing Company, East Pittsburgh, Penn., is marketing a new gasoline blow torch, presenting a number of interesting features which, it is claimed, adapts it to all conditions of service. The burner is constructed particularly heavy so that it will retain its heat and keep the torch burning in cold or windy weather. The drip cup is made especially deep, making it possible to start the torch easily. Another feature is the provision made for automatic cleaning, the needle at the end of the valve stem

broken spring for an indefinite period. The Kantalever may be utilized for any type of break, including that of the main leaf near the spring horn, as the device is provided with an opening through which a bolt may be inserted, practically providing a new horn. The repairer can be applied to any broken section as suitable clamping bolts, etc., accompany the device. The Kantalever is made of 50 point carbon steel and is guaranteed not to break under the strain of any car load. It comes packed in a water proof black bag having two snap clasps and occupies but little room in the car as it can be placed in the tool box.

#### Ridlon Adjustable Wheel Puller.

J. R. Ridlon, 550 Surf street, Chicago, is manufacturing the Ridlon adjustable gear and wheel puller. It comprises a 12-inch screw with a .75-inch standard thread upon which travels a 1.5-inch conical block. On each of the opposite sides of this block are a pair of pulling arms, retained in position by a shoulder screw. Each arm member has nine openings, through which the shoulder screw may be placed, providing nine different adjustments. The pulling arms have a hook end placed at an angle of 135 degrees to the long section of the arms, so that when the long part is at 45 degrees to the screw, the hook end will be parallel with it. This position allows the hook to bear against the gear with its entire face, insuring a firm grip.



## AN INTERESTING EXPLORATION TOUR.

**Itinerary Visits Sections of New England Well Off the Beaten Track, Affording Abundant Opportunity to Search Out the Quaint and Picturesque.**

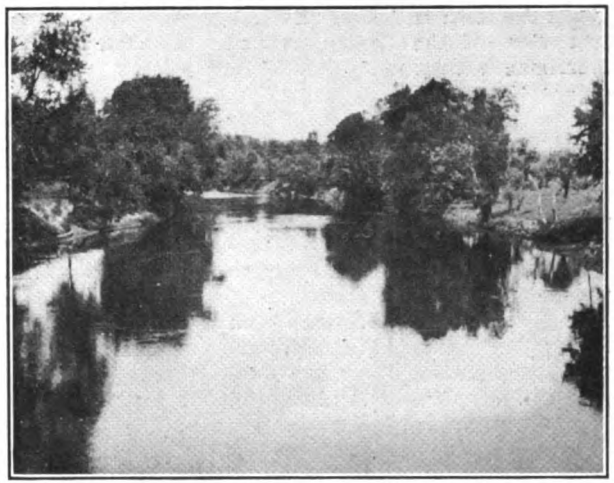
**F**OR those who delight in exploring the highways and byways off the beaten track, no section of the country offers better inducements than New England. Quite as often it is possible to find as good roads connecting the smaller and lesser known towns as on the main trunk lines. Each locality seems to possess its own peculiar charm, and there is so much that is quaint and picturesque that the motorist never tires of seeking new experiences. The itinerary outlined herein as No. 15 combines state highways and backwoods roads in what is regarded as the proper proportions.

given to it in any other manner.

Springfield is too well known to permit of extended comment when considering a tour of exploration. Ludlow is a delightful little place near the falls on the Chicopee river, where the Indians are said to have camped after the destruction of Springfield in 1675. A little further along the route passes the auxiliary reservoir of the Springfield water department and then turns toward Belcher-town, favorably known as a quiet summer place. The town is located on top of a hill, and several bold prominences and handsome ponds are in the vicinity. It was

trunk line, east and west across Massachusetts, splendid roads are the rule.

At Gardner, the way turns northward to Winchendon, past Crystal lake, and with splendid views of Mt. Watatic on the right. Soon after leaving Winchendon it crosses the New Hampshire line, almost under the shadow of Monadnock mountain, glimpses of which have been coming into view ever since leaving Athol. Its rugged top rises 3186 feet above the sea, and from its summit splendid views of the Presidential range in the White mountains far



**At Left, One of the Many Shady Drives in the Vicinity of Mt. Monadnock; at Right, Sunshine and Shadow on the River Near Hartford, Conn.**

Leaving Hartford, Conn., the morning of the first day, the initial portion of the trip is over excellent macadam into Springfield, over the so-called east side route, through East Hartford, Warehouse Point, Thompsonville and Longmeadow. This is the far-famed Connecticut tobacco country, and on either side of the road the fields present almost endless rows of plants, sometimes growing in the open and at other times protected from the damaging hail and wind by stout canvas. This canvas also is used to give the tobacco a certain color and flavor, which, it is said, cannot be

settled in 1731, and was named Cold Spring, because of a large fountain within its border.

Enfield, Mass., also is well known as a quiet summer place, it being a rural hamlet in a farming and dairy district, among high and wooded ridges. Then comes Greenwich, on the old Indian domain of Quabin, and in the shadow of Mt. Lizzie. North Dana, on the shores of Neeseponsett, and New Salem, a highland village near Packard's mountain, are passed on the way to Athol. In Athol much state highway construction is under way, and as this portion of the route to Gardner is over the

to the north may be obtained. The night stop is at Keene.

Dublin, reached early on the second day, is 1500 feet above the sea, near the lovely Monadnock lake and mountain, and in the midst of scenery that has been compared to the richest to be found in Scotland. Hillsboro is the birthplace of President Franklin Pierce. Henniker is a neat and pleasant village with shady streets, which has endeared itself to those who are seeking a restful summer resort amid fair, rural scenery. Many profitable farms are to be found in this vicinity. Hopkinton also is noted for its rich farming





Three Charming Views Which Indicate Road Conditions to Be Encountered Off the Beaten Path in New England.

country, particularly prolific in corn, oats, potatoes and dairy products. It is stated that it came near being the capital of the state, and that is no mere play on words, despite the fact that it is within 8.1 miles of Concord. The tourist will enjoy a visit to Putney Hill, one mile west of the village, with its ancient cemetery and the ruins of Putney fort. It is 500 feet above the town and gives an excellent view of the Contocook and Merrimac valleys and the White mountains.

After reaching Concord, the tour turns down the Merrimac valley, over better-known ways to Nashua for the night stop. The third day takes the tourist the remainder of the way down the valley to Boston, then along the South Shore to Plymouth. The first portion of this day's run is almost too well known for extended description. The latter portion is over the so-called short line to Plymouth, through Quincy and Weymouth.

Quincy is a large and picturesque agricultural town, much of the land having been the estates of Presidents John Adams and John Quincy Adams. Opposite the granite town hall is the Adams Temple, an antique church near which the two Presidents are buried. The district was first settled by Weston's company in 1622, and was first known as Mount Merry. At one time Miles Standish marched against the jovial Episcopalians of the settlement from Plymouth and sent several of the band captive to England.

In 1623, Standish made the attack upon the assembled Indian chiefs described in the seventh part of "The Courtship of Miles Standish," written by Longfellow. After this affair, the Episcopalian colonists left, and in 1624 a company moved in from Weymouth, England, who gave its name to this town.

After spending the night, and as much longer as the tourist de-

sires, in historic Plymouth, the way leads through the ancient wilderness of Plymouth to Middleboro, near which to the south are the great Lakeville ponds.

Taunton was founded by Miss Elizabeth Pool, a pious Puritan of Taunton, England. The settlement was on the territory of Cohannet, and King Philip was particularly friendly to the settlers, until the midsummer of 1676, when he attacked the place, but was driven off and followed sharply until he was killed. In 1810 there were but 50 houses left, but the splendid water power soon induced the location of factories and its growth was decidedly rapid.

A splendid state road leads from Taunton to Providence, through Rehoboth, which town once came within one vote of being selected as the capital of Massachusetts. The Rhode Island line is crossed shortly before reaching East Providence. The route across the state is through some of the older



River Scenes in the Valley of the Nashua River and the Southern Portion of New Hampshire.



towns, in many of which the abandoned factories and farms tell their mute story of the past. The last portion of the way, before entering Connecticut, is through the Indian districts of Attawangan and Minnetixit.

Near Danielson is Mashapaug lake, concerning which it is stated that far back in the ante-colonial days the Indians were accustomed to hold revels on a hill on the site of this lake. During a prolonged merrymaking of four days' length, the Great Spirit became offended and struck out the foundations of the hill, with the result that the lake came into being. Of all the tribe, one woman alone was saved on a small island now standing in the centre of the sheet of water. On still, clear days, it is claimed that the submerged forest may be seen under the deepest waters.

Willimantic is a well-known thread centre, in the town of Windham. The famous battle of the frogs was fought near this city. Bolton Notch is a romantic pass into the valley of the Connecticut river, and the remainder of the distance into Hartford is over well-known ways.

### ITINERARY NO. 15.

Night Stops—Hartford, Conn.; Keene and Nashua, N. H.; Plymouth, Mass. Four Days, 427.7 Miles.

#### Hartford-Keene, 123 Miles.

|                         | Miles to | Total Miles | Out Return |
|-------------------------|----------|-------------|------------|
| Hartford .....          | 0.0      | 0.0         | 123.0      |
| East Hartford ..        | 1.6      | 1.6         | 121.4      |
| South Windsor ..        | 4.1      | 5.7         | 117.3      |
| E. Windsor Hill ..      | 3.5      | 9.2         | 113.8      |
| Warehouse Point ..      | 5.1      | 14.3        | 108.7      |
| Thompsonville ..        | 5.6      | 19.9        | 103.1      |
| Longmeadow, Mass. ....  | 3.8      | 23.7        | 99.3       |
| Springfield .....       | 4.1      | 27.8        | 95.2       |
| Indian Orchard ..       | 4.9      | 32.7        | 90.3       |
| Ludlow .....            | 1.5      | 34.2        | 88.8       |
| Ludlow Centre ..        | 2.6      | 36.8        | 86.2       |
| Belchertown .....       | 10.8     | 47.6        | 75.4       |
| Enfield .....           | 5.0      | 52.6        | 70.4       |
| Greenwich .....         | 3.5      | 56.1        | 66.9       |
| Greenwich Village ..... | 2.0      | 58.1        | 64.9       |
| North Dana .....        | 5.5      | 63.6        | 59.4       |
| New Salem .....         | 2.2      | 65.8        | 57.2       |
| South Athol .....       | 3.6      | 69.4        | 53.6       |
| Athol .....             | 6.2      | 75.6        | 47.4       |
| Baldwinsville ..        | 9.8      | 85.4        | 37.6       |
| Otter River .....       | 1.3      | 86.7        | 36.3       |
| Gardner .....           | 4.6      | 91.3        | 31.7       |
| Winchendon .....        | 8.5      | 99.8        | 23.2       |
| Fitzwilliam, N. H. ..   | 9.5      | 109.3       | 13.7       |
| Troy .....              | 3.7      | 113.0       | 10.0       |

|                  |     |       |     |
|------------------|-----|-------|-----|
| Marlboro Depot.. | 4.2 | 117.2 | 5.8 |
| Keene .....      | 5.8 | 123.0 | 0.0 |

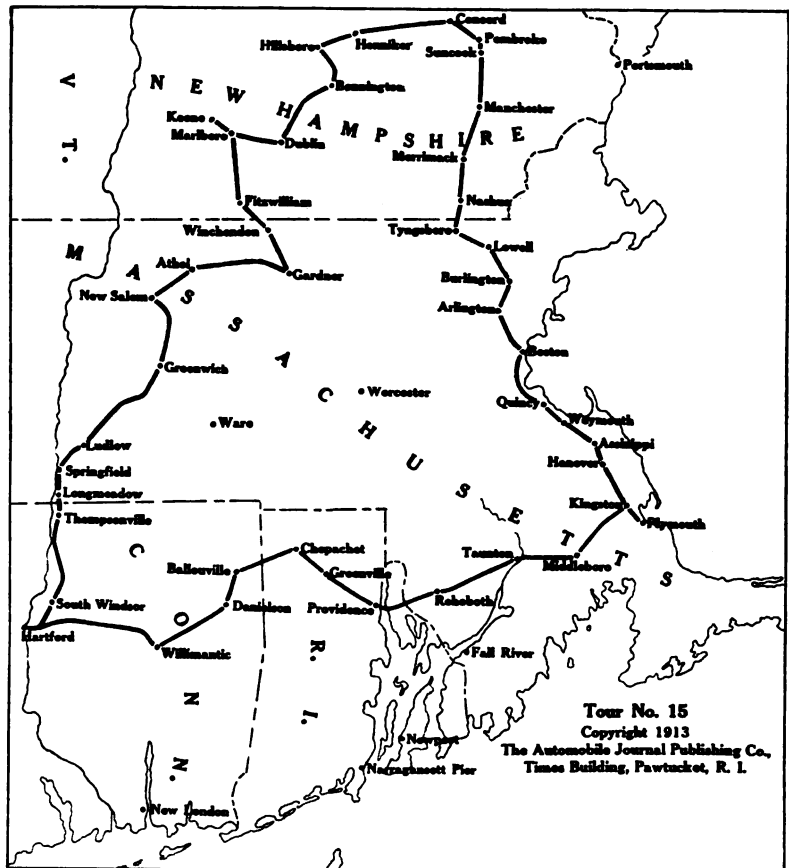
#### Keene-Nashua, 93.6 Miles.

|                     | Miles to | Total Miles | Out Return |
|---------------------|----------|-------------|------------|
| Keene .....         | 0.0      | 0.0         | 93.6       |
| Marlboro .....      | 4.4      | 4.4         | 89.2       |
| Dublin .....        | 8.5      | 12.9        | 80.7       |
| East Harrisville .. | 2.9      | 15.8        | 77.8       |
| Hancock .....       | 4.5      | 20.3        | 73.3       |
| Bennington .....    | 4.1      | 24.4        | 69.2       |
| Antrim .....        | 2.0      | 26.4        | 67.2       |
| Hillsboro .....     | 7.5      | 33.9        | 59.7       |
| Henniker .....      | 6.7      | 40.6        | 53.0       |
| Hopkinton .....     | 8.7      | 49.3        | 44.3       |
| Concord .....       | 8.1      | 57.4        | 36.2       |
| Pembroke .....      | 6.0      | 63.4        | 30.2       |
| Suncook .....       | 1.4      | 64.8        | 28.8       |
| Hooksett .....      | 2.0      | 66.8        | 26.8       |
| Manchester .....    | 8.6      | 75.4        | 18.2       |

|                   |     |      |      |
|-------------------|-----|------|------|
| North Pembroke .. | 2.1 | 68.7 | 13.3 |
| West Duxbury ..   | 3.2 | 71.9 | 10.1 |
| Kingston .....    | 5.5 | 77.4 | 4.6  |
| Plymouth .....    | 4.6 | 82.0 | 0.0  |

#### Plymouth-Hartford, 129.1 Miles.

|                             | Miles to | Total Miles | Out Return |
|-----------------------------|----------|-------------|------------|
| Plymouth .....              | 0.0      | 0.0         | 129.1      |
| Kingston .....              | 4.6      | 4.6         | 124.5      |
| North Plympton ..           | 4.1      | 8.7         | 120.4      |
| Plympton .....              | 2.5      | 11.2        | 117.9      |
| Middleboro .....            | 7.2      | 18.4        | 110.7      |
| East Taunton .....          | 7.2      | 25.6        | 103.5      |
| Taunton .....               | 3.7      | 29.3        | 99.5       |
| Westville .....             | 2.4      | 31.7        | 97.4       |
| Rehoboth .....              | 7.3      | 39.0        | 90.1       |
| East Providence, R. I. .... | 6.3      | 45.3        | 83.8       |
| Providence .....            | 2.5      | 47.8        | 81.3       |



|                     |     |      |      |
|---------------------|-----|------|------|
| West Manchester ..  | 1.1 | 76.5 | 17.1 |
| Merrimack .....     | 7.5 | 84.0 | 9.6  |
| Thornton's Ferry .. | 3.6 | 87.6 | 6.0  |
| Nashua .....        | 6.0 | 93.6 | 0.0  |

#### Nashua-Plymouth, 82 Miles.

|                      | Miles to | Total Miles | Out Return |
|----------------------|----------|-------------|------------|
| Nashua .....         | 0.0      | 0.0         | 82.0       |
| Tyngsboro, Mass. ..  | 6.6      | 6.6         | 75.4       |
| Lowell .....         | 7.9      | 14.5        | 67.5       |
| Billerica .....      | 6.2      | 20.7        | 61.3       |
| Burlington .....     | 5.5      | 26.2        | 55.8       |
| Arlington .....      | 7.4      | 33.6        | 48.4       |
| Cambridge .....      | 3.5      | 37.1        | 44.9       |
| Boston .....         | 3.6      | 40.7        | 41.3       |
| Quincy .....         | 11.5     | 52.2        | 29.8       |
| Weymouth .....       | 3.0      | 55.2        | 26.8       |
| Assinippi .....      | 7.5      | 62.7        | 19.3       |
| Hanover .....        | 3.9      | 66.6        | 15.4       |
| Centerdale .....     | 4.9      | 52.7        | 76.4       |
| Greenville .....     | 3.5      | 56.2        | 72.9       |
| Harmony .....        | 2.5      | 58.7        | 70.4       |
| Chepachet .....      | 4.5      | 63.2        | 65.9       |
| Ballouville .....    | 12.1     | 75.3        | 53.8       |
| Attawangan .....     | 1.2      | 76.5        | 52.6       |
| Elmville .....       | 1.8      | 78.3        | 50.8       |
| Danielson .....      | 2.7      | 81.0        | 48.1       |
| Brooklyn .....       | 3.8      | 84.8        | 44.3       |
| Hampton .....        | 6.1      | 90.9        | 38.2       |
| North Windham ..     | 6.2      | 97.1        | 32.0       |
| Willimantic .....    | 4.5      | 101.6       | 27.5       |
| South Coventry ..    | 6.3      | 107.9       | 21.2       |
| North Coventry ..    | 1.5      | 109.4       | 19.7       |
| Bolton Notch .....   | 7.1      | 116.5       | 12.6       |
| Manchester Center .. | 4.2      | 120.7       | 8.4        |
| Burnside .....       | 4.7      | 125.4       | 3.7        |
| East Hartford .....  | 2.1      | 127.5       | 1.7        |
| Hartford .....       | 1.6      | 129.1       | 0.0        |



## MECHANICAL NOTES FOR OWNERS.

### Dash Side Lights Constructed from Pocket Type of Electric Lamps--Stuffing Box for Leaky Tappets--Equalizer for Separate Rod Brakes.

THE convenience of electric lighting appeals to the motorist, and many owners whose cars are not equipped with dynamos have installed the straight storage battery system. While with this system the battery must be recharged when it becomes exhausted, if employed solely for supplying current to the side lights and tail lamp, it provides satisfactory service. Of course, the number of hours the lamps will burn depends upon the size of the bulbs and the capacity of the battery.

Although lamps may be purchased at a moderate price and there are several devices for converting oil into electrical units, they may be constructed by the owner. The following contribution from a reader is of interest in that he con-

required for a connection between it and the end of the bulb. Securing some round fibre about .125 inch larger in diameter than the opening in the plate, I took it to a machine shop and had it turned up to the shape shown at C. A hole to take a dry cell battery terminal was drilled through the centre of the fibre piece as shown. Before inserting the screw member one end was peined over.

The assembly is shown at A. It will be seen that when the fibre is inserted in the opening of the plate and the latter screwed up snugly, the peined head of the terminal part comes in contact with the centre pole of the electric bulb. A terminal soldered to the lower section of the plate provides the second pole, and by using dry cell terminals the leads from the battery are secured. The lamps were placed in the dash by cutting a circular hole and secured by four small wood screws. They are neat in appearance, and by using lamp cord the wires do not detract unduly from the appearance of the dash. At present I am using the bulbs which came with the lamps and dry cells, but plan to change the lights for tungsten members and employ a storage battery. The tail light is also an electrical unit.

#### RENOVATING FELT WASHERS.

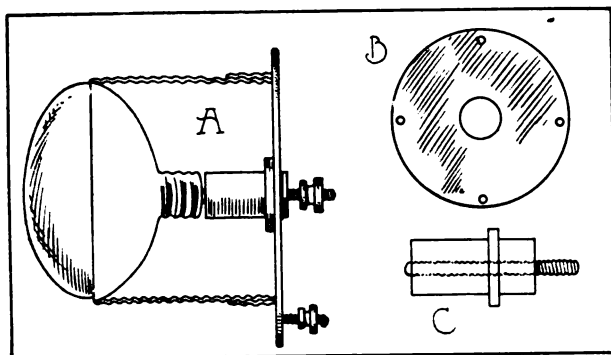
Felt washers that have become hardened or caked with old lubricant may be made serviceable by soaking them in gasoline or kerosene and flexing the material.

#### EFFICIENCY OF DRY CELLS.

The efficiency of dry cells wired in series or multiple series is impaired if one or more in the set is decidedly below the average of the others. Test each cell with an ammeter and throw out any that falls considerably below that of the others.

#### SLOTING BOLT HEADS.

When round-headed bolts are fitted to the chassis and used to hold some part in place by means of a lock nut, these members are difficult to remove after becoming rusted. If the bolt has a square section near the head, it will turn when fitted in wood. Often it is impossible to get a grip with a Stillson wrench on the head of the bolt, and using a wrench on the nut simply rotates the bolt as a whole. If a hacksaw can be applied to the head of the bolt, cut a small slot and deep enough to take the tip of a screw driver blade. Then apply kerosene to the thread and nut and by holding the head with a screw driver, the refractory bolt may be removed.



Dash Side Electric Lights Made from Pocket Type of Lamp: A, Showing Construction; B, Plate for Securing Lamp to Dash; C, Fibre Block Carrying Terminal and Used to Connect One Lead of Battery to Bulb.

verted a pair of old pocket type electric lamps into dash members and at a very slight expense.

The suggestion of one of your readers for making an emergency tail light, which was printed in the last issue of your book, gave me an idea for making side lights. I am enclosing a rough sketch showing how the work was done, and I did all of it except turning down the fibre pieces.

I had a pair of electric flash lights of the round type and having a bull's-eye end. The section carrying the bulb and reflector is screwed on a circular shell, the last named serving as one side of the circuit. The other connection is made by the little dry cell which slips into the shell, the battery having a small, round brass terminal in the centre which comes in contact with the centre part of the stem of the bulb, completing the circuit.

I cut the shell just back of the threaded section, as shown at A in the accompanying illustration. To this I soldered a circular piece of heavy brass plate about .5 inch larger in diameter than that of the shell. This plate is shown at B, and it will be seen that a hole is drilled in its centre, also four other openings to take screws when the plate is secured to the dash.

By screwing on the plate I ascertained the distance



## FITTING EQUALIZER TO BRAKES.

Equalizers are utilized with braking systems to insure an even or balanced pull on the brakes proper, which is difficult to secure if each brake rod must be adjusted separately, as was the case with some older forms of braking systems. When the separate rod system is employed, it is customary to jack up both wheels, lengthen or shorten each rod and try the resistance of the wheel by hand with the brakes partially and wholly set. While it would appear that this method would give satisfactory results, a variation in the adjustment of the wheel bearings, etc., is apt to make considerable difference when the wheels are supporting the weight of the car and passengers. The following method of fitting an equalizer to an old car is suggested by a reader, who states in his communication that the ex-

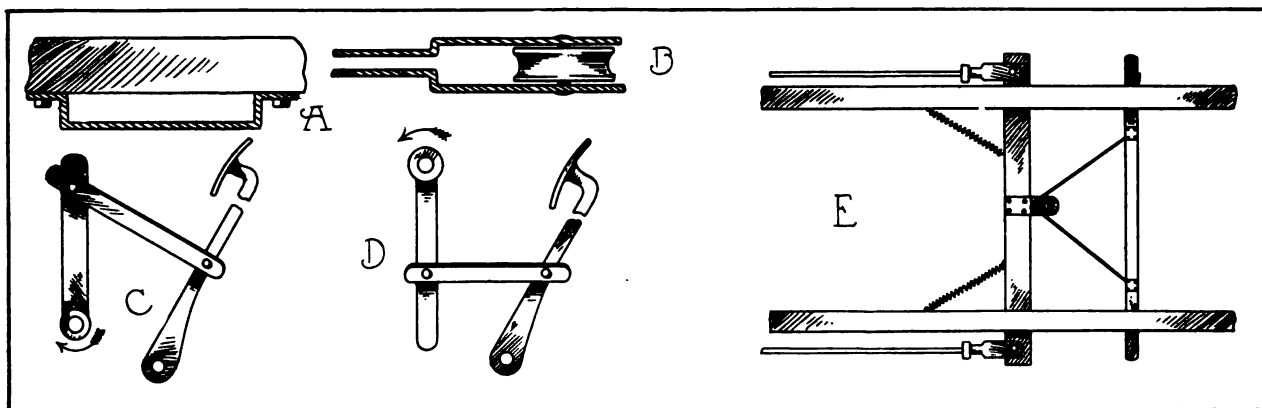
keep the brakes normally in a released position.

I utilized the old brake bar to obtain the desired leverage. It formerly rotated as shown at C, but as it was necessary to line up the equalizer with the old bar and to have a straight, even pull, I changed the direction of rotation by reversing the position of the lever as shown at D.

By displacing the old bar, removing the bell cranks from each end and fitting these to the underside of the bar, I was able to obtain a straight pull and in the desired forward direction. The ends of a wire cable were attached to these levers, and as the cable operated on the roller pulley, the pull was equalized. I might add that I faced the bracket attachment and the underside of the frame with sheet fibre to prevent the equalizer rattling. The entire work, with the exception of the bracket and pulley support, was performed by myself. The cost of the metal work was slight, and I am now able to obtain good service from the brakes.

## TAPPET GUIDE STUFFING BOX.

It is not uncommon on lifting the hood of an old motor to note that it is covered with dirty lubricant. This is generally due to worn tappet



Contribution from a Reader, Illustrating Method of Fitting Equalizer to Braking System on an Old Car: A, Bracket Bolted to Frame and Carrying Equalizing Bar; B, Pulley and Bracket; C, Original Direction of Rotation of Old Brake Bar; D, How It Was Changed to Obtain a Forward Pull to Cable.

pense was slight and that the greater part of the work was of the home-made order:

I am enclosing a sketch of how I fitted an equalizer to the brakes on my car, which is an old one, having but one set, these acting on the interior of the drums of the rear wheels. The brake pedal, when pushed forward slightly, rotated a round bar extending across the frame of the chassis, and to this bar was fitted a bell crank at either end. To the lever on each side was attached the brake rod.

I experienced considerable trouble in adjusting the brakes so that each would hold alike, although I was very careful in the work. The bell crank levers also worked loose, creating considerable lost motion in the pedal mechanism, so I decided to fit an equalizer. I found it would not be advisable to cut a slot in the frame to carry the sliding equalizing bar, as the frame was too light, and in addition it would be a troublesome job.

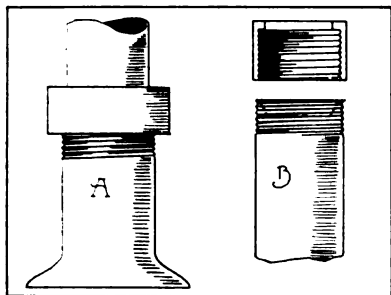
I solved the problem by making a clamp as shown at A, and by drilling holes in it and the frame and using bolts I was able to fasten it in a rugged manner. The equalizing bar was made of iron, and before inserting it I drilled a hole at either end to take the brackets of the brake rods. I also drilled the holes to retain the pulley member shown at B. The latter was made to slip over the bar after it was located, and secured by bolts and lock nuts. The bar was also drilled to take the ends of two springs which were fastened to the frame as shown at E in the sketch. These spring members served to

guides, although sometimes the fluid will work out around the end bearings of the crankshaft. The best method of repair is to fit new guides and tappets, although the former may be turned to fit the pushrods.

In an accompanying illustration is shown a stuffing box which the writer noted fitted to an old motor. The guides were of bronze, a drive fit in the upper crankcase and projecting above the top of the case about .625 inch. In overhauling the motor it was noted that the pushrods were worn badly and that new members, as well as guides, would be required. This would involve an expenditure of \$10.80 for new members, so the stuffing boxes illustrated in the drawing were made.

The valves and pushrods were displaced and a thread cut on the outside of the guides as shown at B. The interior of the guide was countersunk as indicated by the dotted lines. The stuffing box





Stuffing Box for Leaky Tappet Guides.

was constructed of a piece of heavy brass tubing, drilled to form a lip at the top to hold the packing and threaded inside. By using one strand graphited candle wicking, soaking it with oil in the stuffing box, and screwing it down properly, the loss of lubricant from the crankcase was prevented. The device could be improved further by utilizing a lock nut below the stuffing box, this depending, of course, upon the space between it and the crankcase. The same method could be applied to some types of worn valve stem guides where considerable auxiliary air is noted.

### TIMING THE PRIMARY CIRCUIT.

Although the magneto has supplanted the timer, coil and battery system of ignition, the commutator is fitted for starting purposes and as an auxiliary on some cars, and as standard equipment on others, particularly old types. Timers will wear, and if they are not given proper attention, such as cleaning and oiling, troubles will develop in time, requiring a new member or repairing of the roller, contact blocks and bushings.

Many owners not familiar with the principles of the timer system of ignition hesitate to displace the commutator for repairs, and often in so doing are obliged to call in the expert to retim the ignition. The fitting of a new timer will require a knowledge of timing, but the replacing of a commutator after repairs may be accomplished easily and correctly by taking a few simple precautions.

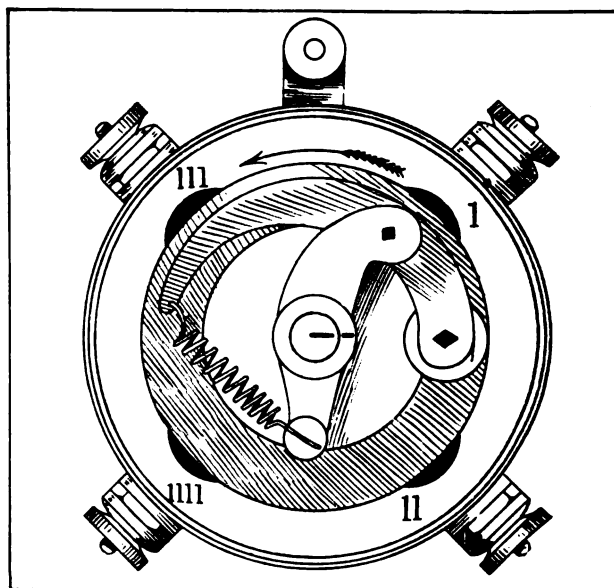
In an accompanying illustration is shown a conventional type of four-cylinder timer, and it is assumed that the drawing represents it in its normal position; that is, with the spark lever fully retarded. It should be borne in mind that the timer proper does not rotate except for a very short distance and only when moved by the rods connecting it with the spark lever. The roller rotates with the timer shaft, or camshaft, and in the illustration the shaft runs anti-clockwise, or to the left.

As the roller comes in contact with the blocks, to which are secured the primary wires through terminals, the primary circuit is closed and the

current built up into a high-tension and led to the plugs by cables from the coil. In the drawing the timer is wired for a four-cylinder motor firing 1, 3, 4, 2. It will be noted that the fibre ring in which the contact blocks are imbedded is marked I, II, III and IIII. It also will be seen that the roller in rotating to the left makes contact in the following order: I, III, IIII, II. By marking these numbers on the fibre it is a simple matter to replace the wires in their proper order. It should be remembered that the rod member should be connected to the timer before the wires are replaced.

Some types of timers are secured to the shaft by set screws, while others are held by a locking nut screwed onto the top of the shaft and over the lever member. If the top of the shaft and the lever mechanism are marked as shown in the drawing before displacing the timer, it will be a simple matter to replace it without going to the trouble of retiming it by the location of the piston or crankshaft.

In explanation, it may be stated that with four-cylinder motors the crankshaft makes two complete revolutions to one of the timer shaft, and that a cylinder explodes every quarter-turn, or 90 degrees, as represented by the travel of the roller. Ordinarily the roller would be approximately between two blocks, the I and II, as indicated in the drawing, for example. If the timer is replaced on the shaft so that the two lines coincide, the original timing will be observed. In replacing the timer care should be exercised to see that the spark lever is fully retarded.



Showing How a Timer May Be Marked to Insure Correct Replacement of Wires, also Correct Timing.



**CLOGGED GAS BURNERS.**

Motorists whose machines are equipped with acetylene for lighting have experienced the annoyance of having one of the burners of the headlights become partially clogged, causing the flame to shoot backward or forward. Sometimes this will result in a cracked mirror. The best method of cleaning a burner is to utilize the needle device manufactured for this purpose, but it may happen that one will be caught without the tool and some distance from the nearest garage. The usual procedure is to employ the tire pump, which often removes the deposit. This will not, however, always prove satisfactory. The following hint is contributed by an owner who states that it has been employed with success:

Remove the burner from the lamp and cover the air passages and one gas outlet by the finger tips, then blow through the burner. By noting the resistance, then trying the other outlet, it may be determined easily which one is at fault. If the passage cannot be cleared by the usual methods, reverse the burner and blow through the gas tip end. Unless badly clogged the gas passage will usually yield to this treatment.

Another suggestion is to tap the metal base of the burner with a pair of pliers. The application of the tire pump to the tubing is not recommended as the pressure is likely to burst the rubber walls.

**DIRECT FACTORY BRANCH.****British Manufacturer of Commer Trucks to Take Over Business in America.**

Commercial Cars, Ltd., Luton, England, maker of the well-known Commer truck, is to establish a direct branch of the company at New York City, with A. C. Platt, formerly connected with the Wyckoff, Church & Partridge firm, as manager. It is stated that arrangements for the manufacture of the truck in this country may be made later.

Mr. Platt explains that he has 18 or 20 trucks now on hand, and he is now seeking a suitable location. When the Commer Truck Company of America was incorporated in March with a capital of \$3,000,000, it was presumed that it was for the purpose of taking over the Commer business in this country, which was interrupted by the failure of Wyckoff, Church & Partridge. The English company decided, however, on the expiration of the contract, that a direct branch here would serve its interests better.

**BORLAND'S RECORD MILEAGE.****Richard Mansell Drives Electric Roadster 97.2 Miles on Single Charge.**

One of the features of the recent picnic of the Electric Vehicle Association and the Electric Garage Men's Association of Chicago at Cedar Lake, Ind., was the remarkable run made by a Borland electric roadster, the product of the Borland-Grannis Company of that city. The distance over the road, according to a Warner speedometer attached to the machine, was 97.2 miles, and this was covered on a single charge of the battery. Several difficult grades and hills were encountered, and the average speed on the level was 15 miles an hour.

A special train carried a large delegation of electric vehicle men to the picnic grounds, while



**Richard Mansell of Chicago on 97-Mile Cross-Country Trip in Borland Electric Roadster.**

several others went in gasoline cars. The festivities were at their height when Richard Mansell, Chicago retail branch manager for the Borland-Grannis Company, drew up in front of the tables in his roadster. Immediately, the entertainment programme was suspended to hear the report of the trip.

The car used was a regular stock model, equipped with a 42-cell, 11-plate Hycap-Exide battery, made by the Electric Storage Battery Company, Philadelphia. The run created a decided sensation all along the route, and when the electric car men in Crown Point heard of it, they assembled their machines to escort Mansell through the town on his return trip.

Supply men state that figures are being asked for by manufacturers of cyclecars, who will turn out in the neighborhood of 30,000 machines in the first lots of four Detroit factories.





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## FEDERAL ROAD FUNDS.

The widespread interest which has been created in the subject of good roads is the result of the agitation systematically carried on by motorists. Within the past year there has been a growing disposition to inquire more closely into the methods by which it is proposed to secure the improved highways, the need for which is now generally acknowledged. Automobile owners have every reason for interesting themselves in this aspect of the situation, largely because they are called upon to make substantial contributions for construction and maintenance.

Although several bills have been introduced into Congress, practically the only money which the United States government has appropriated for improved roads was that made available as

a part of the postoffice appropriation act of August, 1912, when provision was made for expending \$500,000 under the direction of the Secretary of Agriculture, in co-operation with the Postmaster-General, for the improvement of post roads. It is required by the act that the state or local sub-division in which the improvement is made shall appropriate twice the amount allotted by the federal government, and that the joint fund thus created shall be spent entirely under the direction of the Secretary of Agriculture.

The office of public roads, a bureau of the Department of Agriculture, is authority for the statement that an effort was made to allot this appropriation equally to all of the states, but this was found to be impracticable. The reason for this decision is not hard to understand, since there are 48 states, each of which would have been entitled to but \$10,000. Instead, the allotments have been made with a view to ascertaining the probable cost of post road construction in various sections of the country. Ohio, for instance, is understood to have drawn \$120,000, or practically one-fourth of the entire appropriation. This is to be expended on the national pike, first constructed by the federal government in 1836 and 1837 as a military post road.

This step is an important one, because of its bearing upon the entire question of federal construction and supervision of highways. It should be followed by motorists and others, because the general public will sooner or later be called upon to make decision as to whether this plan shall be continued or some other method shall be adopted.

Motorists are promised that the subject of uniform motoring laws will receive decided attention at the forthcoming convention of commissioners on uniform state laws, to be held in Montreal. Each state in the union will be represented by duly accredited delegates appointed by the governors of the several commonwealths. There can be little doubt that even an informal discussion of the need for uniform motoring laws among men who are clothed with some authority from the various states will be of benefit. However, it is extremely unfortunate in some respects that whenever conventions of this type are held the delegates from the United States always find themselves absolutely without authority to take definite action.



## STUTZ WINS AT SANTA MONICA.

**Earl Cooper Takes His Third Long Distance Road Race for the Season—Barney Oldfield and Louis Nikrent, Driving Mercers, Finish Second and Third.**

**I**N WINNING the Santa Monica road race of 1913, Earl Cooper not only has created for himself an enviable reputation among the racing drivers of the year, but he has established the Stutz car as a worthy contender for premier honors in a field comprised of some of the fastest makes of machines in the world. This was the third great victory for Cooper and the Stutz on the Pacific Coast this season. July 5, he took the 220-mile race for the Potlach trophy at Tacoma, Wash., only to follow this with the Montamara-thon award, July 7, over the same course, this latter event being for 250 miles.

This year, the road race over the course at Santa Monica, Cal., was for 445 miles, Cooper's

time for the distance being 6:01:52. In this respect the event ranks in importance with the 500-mile contests on the Indianapolis speedway. If memory serves correctly, it was the longest race of this character held in this country. And for this reason, and because the cars

were limited to 600 cubic inches piston displacement, it was not expected that the speed would prove record breaking. Cooper's average was 73.8 miles an hour.

In 1910, Teddy Tetzlaff in a Lozier covered the 202 miles at an average speed of 73.22, which at that time was a new American road-racing record. In 1911, Harvey Herrick in a National covered the 202 miles at a speed of 74.63, a new world's record. Last year, Tetzlaff regained the honors lost in 1911, this time driving a Fiat 303 miles at a speed of 78.5 miles an hour, which figure is still the world's record. Tetzlaff's Fiat had a piston displacement of 904.7 cubic inches, against 400.2 for Cooper's Stutz this year. Cooper

was a contender last year, also in a Stutz, and was running in fourth place when the race was called.

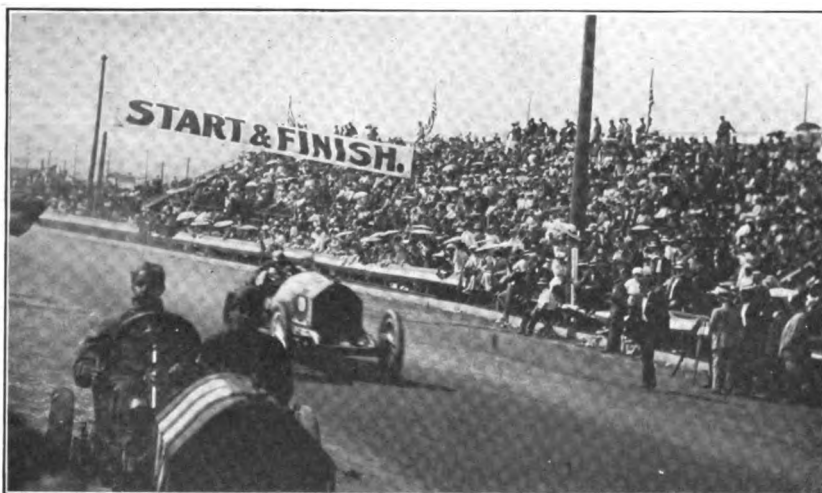
Barney Oldfield, driving a Mercer, finished second in this year's race, his time being 6:07:45. Louis Nikrent in another Mercer was third, in 6:28:17. Four other cars were running when the race was called immediately after Nikrent crossed the finish line. Frank Verbeck in a Fiat completed 49 laps in 6:23:17; E. F. McConnors in a Speedwell, 43 laps in 6:23:14; Charles Soules, Cadillac, 39 laps, 6:07:11, and T. J. Beaudette, Cadillac, 36 laps, 6:24:44. The race was for 53 laps of the course, and the other cars entered were: Gaston Morris, Berlin special; Harris

Hanshue, Apperson; Teddy Tetzlaff, Fiat; Dave Lewis, Stutz; John Opsahl, Buick; Frank Goode, Apperson, and Frank Siefert, National.

It was a great race from start to finish, with nearly all the California favorites in the running. Hanshue won the first Santa Monica with an

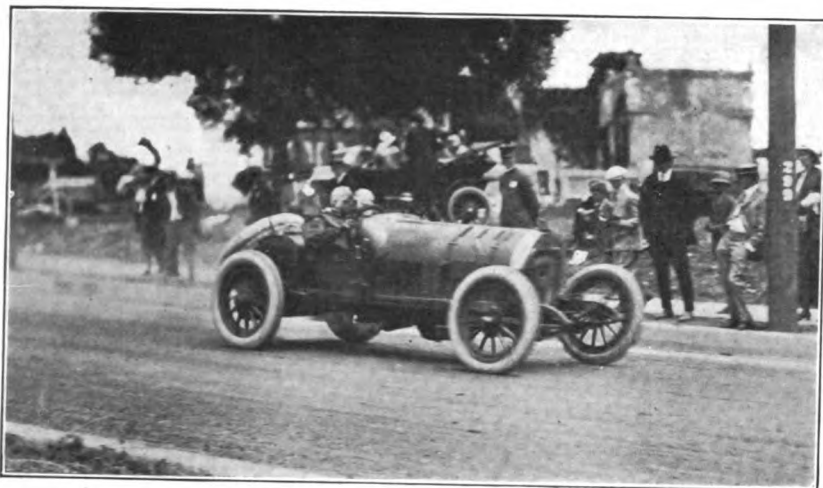
Apperson. Tetzlaff had been a winner twice. Verbeck was fresh from his victory in the Los Angeles-Sacramento event of July 4. Even Barney Oldfield was there. The spectators were assured of all the speed of which the cars were capable.

Oldfield and Cooper took part in a splendid battle for leadership. With less than 100 yards separating them on the next to the last lap, the Stutz slowed up at the pits for a tire change. The Mercer rounded the turn almost on two wheels and went into the straightaway with a rush. For the first time Cooper lost his cool composure when his mechanic failed the third time to send the rim home. Jumping from the car,



**Earl Cooper, Winner of the Fifth Annual Santa Monica Road Race, Crossing the Finish Line in His Stutz.**





**Barney Oldfield and His Mercer, Second Place Combination, Taking the Straightaway in Pailsades Avenue.**

Cooper took the rim and sent it into place with a jerk. In the meantime Oldfield had met with similar trouble on one of the back turns, and the Stutz rolled home a winner by nearly six minutes.

While the two leaders were battling for first place, Nikrent in a second Mercer, Goode and Hanshue in Appersons and Beaudette in a Cadillac, were fighting for third place. The pace proved too much for the winner of the first Santa Monica, however, and he was forced to withdraw. Goode then took the lead in this section and seemed to have an excellent chance of finishing something better than third.

The next round of the course Goode failed to appear. The wait stretched into minutes, and still no Apperson. At last Goode drove up to the pits, exclaiming, "It's all off. I took on gasoline on the back stretch out of a control pit, and I failed to ask the referee for permission."

His friends urged him back into the race, and soon he was under way again. He finished in fourth place, right behind Nikrent in the Mercer. Then arose the question of his disqualification, and several of the drivers were ready to enter a protest. Referee Wadhams settled the controversy by declaring, "You were automatically disqualified." When the situation had cleared somewhat, it was realized that Goode had played the part of a true sportsman, and all talk of protest was dropped at once.

Last year, Earl Cooper and the Stutz were entered in six

events, in four of which he finished in first place. One of his victories was a 150-mile race at Tacoma, Wash. The Stutz and Mercer teams have been striving for premier honors during the past two seasons. Cooper appears to be doing his full share toward placing the former at the head of the list. In view of his splendid achievements thus far this year, it will not be at all surprising to see him at the wheel of a Stutz car in some of the big races yet to be held, notably the Elgin events of Aug. 29-30, the speedway meet at Corona, Cal., Sept. 9, and the Vanderbilt Cup and Grand Prize races in Savannah, Nov. 24 and 27.

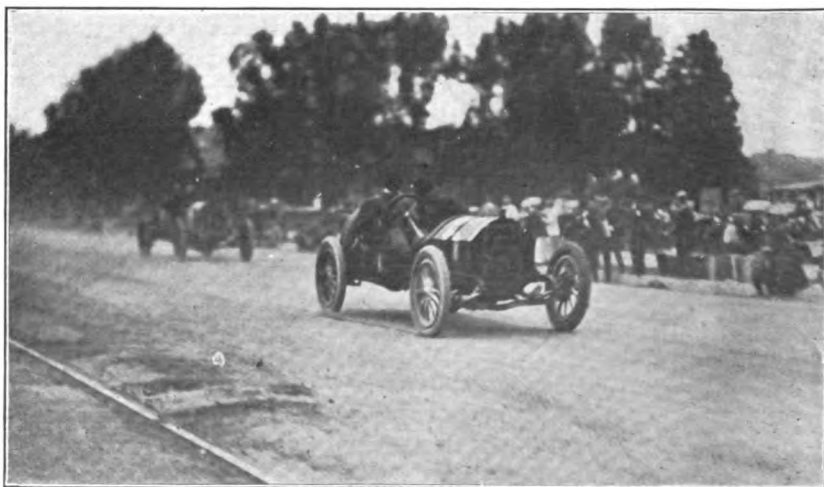
### WILBUR WINS FREE-FOR-ALL.

#### Rickenbacher in a Mason Takes Three Events in Chicago Meet.

The race meet at the Libertyville track, Chicago, Aug. 9, was well attended and some interesting races were run. Eddie Hearne in a Case proved a winner in the event for Chicago cars, F. C. Wilbur in a Mercer took the free-for-all and Eddie Rickenbacher in a Mason returned a victor three times. The summary:

#### Five Miles, Chicago Cars.

| Car    | Driver | Time    |
|--------|--------|---------|
| Case   | Hearne | 5:43.05 |
| Mercer | Wilbur | .....   |



**Frank Verbeck in Fourth Place Flat, Trying to Pass Louis Nikrent in Third Place Mercer.**



|                                    |              |         |
|------------------------------------|--------------|---------|
| <b>Ten Miles, 600 Inches.</b>      |              |         |
| Mason                              | Rickenbacher | 9:07.11 |
| Case                               | W. Endicott  | .....   |
| <b>Five Miles, 300 Inches.</b>     |              |         |
| Mason                              | Chandler     | 5:10.80 |
| Case                               | W. Endicott  | .....   |
| Case                               | Ulbrecht     | .....   |
| <b>Five Miles, 301-450 Inches.</b> |              |         |
| Mason                              | Rickenbacher | 5:05.08 |
| Case                               | W. Endicott  | .....   |
| <b>Ten Miles, 600 Inches.</b>      |              |         |
| Simplex                            | Disbrow      | 9:44.50 |
| Mason                              | Rickenbacher | .....   |
| Case                               | W. Endicott  | .....   |
| <b>Five Miles, Free-for-All.</b>   |              |         |
| Mercer                             | Wilbur       | 4:44.75 |
| Mason                              | Rickenbacher | .....   |
| Case                               | Ulbrecht     | .....   |

### MERCER MAKES CLEAN SWEEP.

**Takes Every Event on the Programme at the Brighton Beach Meet.**

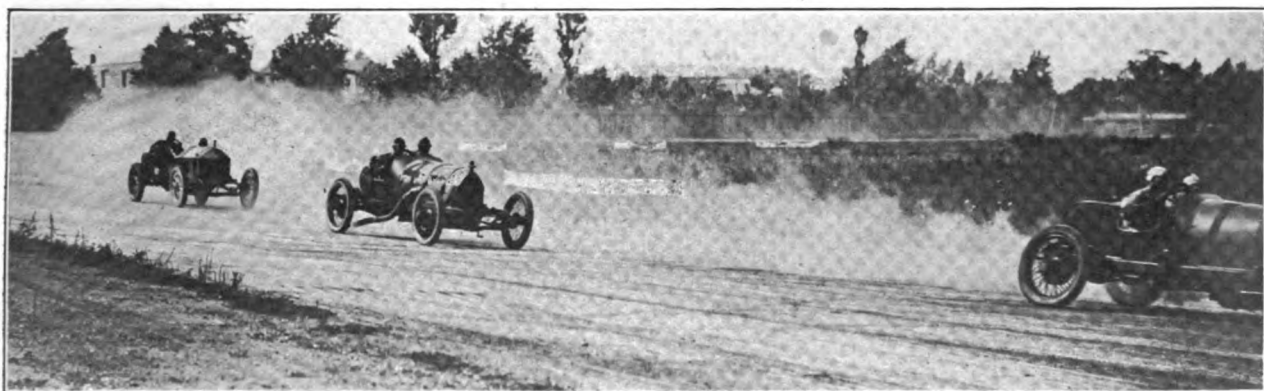
The matinee meet at Brighton Beach, Long Island, Aug. 9, was decidedly Mercerized. Ralph

|   |         |         |
|---|---------|---------|
| <b>Twenty-Five Miles, Free-for-All.</b> |         |         |
| Mercer                                  | DePalma | 24:40.8 |
| Mercer                                  | Wishart | .....   |
| Mason                                   | Mulford | .....   |
| <b>Ten Miles, Free-for-All.</b>         |         |         |
| Mercer                                  | DePalma | 10:25.0 |
| Mercer                                  | Wishart | .....   |
| Mason                                   | Mulford | .....   |

### PROVIDENCE WINS AWARD.

**Waite Auto Supply Company Gets Capital Prize in Weed Tire Chain Contest.**

In the contest concluded by the Weed Chain Tire Grip Company, New York City, in which 12 prizes were offered, totalling \$250, for the best trimmed windows arranged by supply and accessory dealers, the first prize of \$100 went to the Waite Auto Supply Company of Providence, R. I. This concern dressed its window to represent a village with houses, roads, railroads and dangerous grade crossings, a snow scene and other effects. In this setting was woven the



DePalma in Mercer Leading Wishart in Another Mercer and LeCain in Stutz at the Finish in Recent Brighton Beach Meet.

DePalma in a Mercer car took five of the six events, and Spencer Wishart in another car of the same make took the sixth. Mercers also finished in second place four times and in third twice. It was not a Mercer meet, exactly, since several other makes of machines competed in each of the six events. The results follow:

|   |          |         |
|---|----------|---------|
| <b>Ten Miles, 231-300 Inches.</b>       |          |         |
| Car                                     | Driver   | Time    |
| Mercer                                  | Wishart  | 10:17.0 |
| Roberts                                 | Roberts  | .....   |
| Mercer                                  | Ferguson | .....   |
| <b>Ten Miles, 301-450 Inches.</b>       |          |         |
| Mercer                                  | DePalma  | 10:10.0 |
| Stutz                                   | Hickman  | .....   |
| <b>Five Miles, 600 Inches.</b>          |          |         |
| Mercer                                  | DePalma  | 5:08.0  |
| Mercer                                  | Wishart  | .....   |
| Mercer                                  | Ferguson | .....   |
| <b>Twenty-Five Miles, Free-for-All.</b> |          |         |
| Mercer                                  | DePalma  | 24:33.8 |
| Mercer                                  | Wishart  | .....   |
| Stutz                                   | LeCain   | .....   |

danger of skidding and the safety of Weed chains. Following is the complete list of winners:

First, \$100, Waite Auto Supply Company, Providence, R. I.; second, \$50, Bannister & Pollard Company, Newark, N. J.; ten prizes of \$10 each, Tri-State Supply Company, White Plains, N. Y.; Albert E. Goodby, Providence, R. I.; Hamilton Hardware Corporation, Waterbury, Conn.; Blue Ribbon Garage, Bridgeport, Conn.; Herr & Co., Lancaster, Penn.; Post & Lester Company, Boston, Mass.; Louisville Auto Supply Company, Louisville, Ky.; Dayton & Walker Hardware Company, Paterson, N. J.; Ferris-Dunlap Auto Supply Company, Dallas, Tex.; Bl-Motor Equipment Company, Boston, Mass.

Moved to action by the apparently increasing motor car accidents caused by speeding automobiles, Commissioner of Motor Vehicles Lippincott of New Jersey has urged the co-operation of all the police departments of the state in letters which he has sent out, setting forth that it was impossible for him to do more than exercise general supervision over the principal highways.



## RECENTLY ANNOUNCED 1914 MODELS.

### Packard Adopts Worm Bevel Gear Drive—Church Features Pneumatic Transmission— Marion Brings Out a Six—Two-Speed Rear Axle on Cadillac.

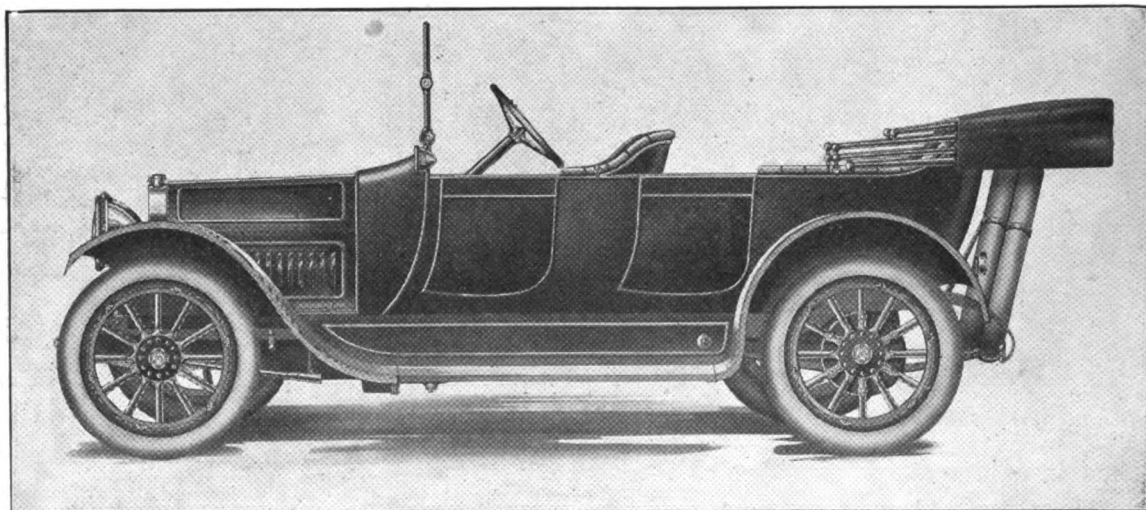
**W**HILE The Automobile Journal desires to present full details of the season's new models as early as possible, lack of space prevents extended comment on each of these immediately after they are announced by the manufacturer. In addition to those more fully described in this issue, the following announcements have been made recently, attention being directed particularly to the more important features:

**Packard**—The Packard Motor Car Company, Detroit, is soon to produce new 38 and 48 horsepower models which will incorporate a new type of worm bevel gear drive. It is explained that this drive will comprise a bevel gear and pinion having teeth which bear the same relation to ordinary bevel gear teeth as do the teeth of

full floating rear axle; tires, 36 by 4.5 inches; wheelbase, 128 inches. Equipment includes Westinghouse electric lighting and starting systems, demountable rims and one extra rim.

**Abbott-Detroit**—Abbott Motor Company, Detroit. Belle Isle model, three-passenger roadster and seven-passenger touring. Motor, six-cylinder, rated at 50-60 horsepower. Standard equipment includes electric lighting and starting, with separate motor and generator units, and magneto ignition. Other models in the line will include 34-40, four-cylinder, five-passenger touring car and roadster; 44-50, four-cylinder seven-passenger touring, five-passenger demi-tonneau and three-passenger roadster.

**Allen**—Allen Motor Company, Fostoria, O. Model 40 five-passenger touring car. Motor, four-cylinder, en bloc, 4.125-inch bore, five-inch stroke; unit power plant, three point suspension; thermo-syphon cooling; constant level splash lubrication; Splitdorf dual magneto; multiple disc clutch, lined with Raybestos; three-speed transmission; full floating rear axle; semi-elliptic springs forward, three-quarter rear; 34 by four-inch tires; left hand drive,



**Allen Five-Passenger Touring Car, Having Four-Cylinder Block Motor, Rated at 40 Horsepower.**

the now familiar spiral or helical spur gears to ordinary spur gear teeth.

**Church**—The Church Motor Car Company, 2019 Michigan avenue, Chicago, has placed in the market a new car embodying the Church pneumatic system. The motor is a four-cylinder, two-cycle unit, cast en bloc, with bore of 3.5 inches and stroke of five. Connection with the propeller shaft is through a rotary air pump, which takes the place of both clutch and transmission, at the same time precompressing the air used in the motor cylinders, the fuel being injected later. Two bodies, a four and a six-passenger, will be fitted. Equipment includes electric lighting, air starter, tire inflator, air jack, etc.

**Palmer-Singer**—Palmer & Singer Manufacturing Company, Long Island City, N. Y. Model K Brighton Six; two-passenger roadster, four-passenger toy tonneau, five-passenger touring. Motor, six-cylinder, cast in three, four-inch bore, five-inch stroke, rated at 45 horsepower; ignition, Eisemann dual high-tension magneto; lubrication, combined splash and pump system; three jet carburetor; multiple disc clutch, three speeds forward and reverse;

centre control; Auto-Lite electric starting and lighting, demountable rims with one extra rim. Roadster will be built on same chassis.

**Marion**—Marion Motor Car Company, Indianapolis, Ind. Marion Six models G5, five-passenger touring, and G2, two-passenger roadster. Motor, six-cylinder, L head, cast in three, 3.75-inch bore, 5.25-inch stroke; lubrication, combination force feed and automatic level splash, in which conventional breather pipe is eliminated; Westinghouse lighting and starting system, with drive direct to the front end of the crankshaft through silent chain at a reduction of 15:1; magneto ignition, multiple dry disc clutch, Marion type rear system with three-speed transmission rigidly bolted to differential housing, left hand drive, centre control.

**Cadillac**—Cadillac Motor Car Company, Detroit. The chief feature in the new model is the use of a two-speed direct drive rear axle, which has a low speed ratio of 3.66:1 and a high speed ratio of 2.5:1. It is maintained that with an engine speed of 700 revolutions a minute the low gear direct drive will give a car speed of 21



miles an hour and the high 30. The change in speeds is effected by means of an electric switch. Other details have not been made public as yet.

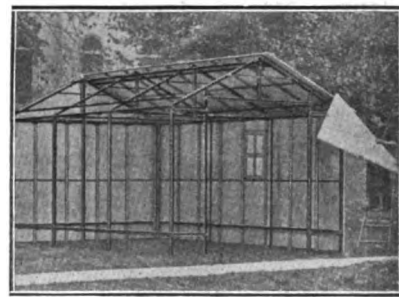
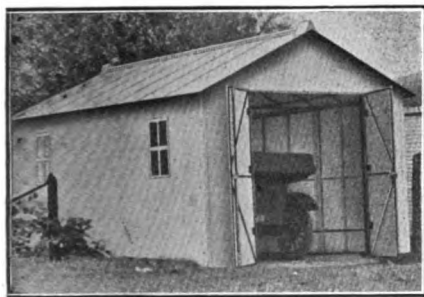
**Victor Cyclecar**—Victor Motor Car Company, 271 Diamond street, Philadelphia, Penn. Two passengers, side by side. Motor, four-cylinder, water-cooled, 3.25-inch bore, four-inch stroke; cone clutch, three speed selective sliding gear transmission, bevel driven rear axle, wire wheels, 30 by three-inch tires, wheelbase 90 inches, tread 52. Equipment includes top and windshield.

**Downing-Detroit Cyclecar**—Downing-Detroit Cycle Car Company, Detroit. Two passengers, tandem. Motor, two-cylinder, air-cooled, V, 3.5-inch bore, 3.67-inch stroke, rated at 12 horsepower; ignition, Bosch high-tension, armored type magneto; carburetor, Schebler; transmission, two speeds forward and reverse; semi-elliptic springs front and rear; tires, 28 by 2.75 inches; wheelbase, 103 inches; tread, standard, 56 inches.

### RUBY PORTABLE GARAGE.

**Constructed Entirely of Steel to Provide Against Fire, Weather and Theft.**

The practicability of the portable garage is demonstrated by the fact that something over 35,000 are being used throughout the country.



Two Views of Ruby All-Steel Portable Garage and Method of Assembling the Various Sections.

Extended service also has indicated the value of these structures as permanent buildings, since by their use the probability of the garage being a total financial loss should the home be sold, is eliminated, the building being transported readily and having a market value at all times.

The Kolb Sales Company, United States Rubber building, New York City, is distributor for the Ruby all-steel garage, which is of the sectional type. The buildings are very complete, including provisions for windows, doors, work bench frames, etc. The material is heavy galvanized steel, 28 gauge stock being used in the side and end walls and 26 gauge on the roof. The sections are formed by electrically welding the galvanized steel on one by one-inch steel angle frames. The sections or panels are grooved in the frame and are fitted into place by stationary clips on the horizontal rail which forms the tongue. The edges of the sections also engage on the tongue and groove principle, forming airtight joints. No bolts or screws are used, ex-

cept two locking bolts at the extreme ends of the wall.

The doors of the standard garage are eight feet high by seven feet wide in the clear. The swinging doors are each hung on three six-inch extra heavy pressed steel hinges. The windows are of approved fireproof construction and occur in two of the sidewall sections. These are 21 by 34 inches, set in a galvanized steel frame, and are glazed with four nine by 16-inch lights .3125-inch thick, ribbed and run in fine wire mesh. Inasmuch as the sidewall sections are interchangeable, the windows may be placed where desired.

It is interesting to note that these buildings can be furnished to meet almost any requirement, being made practically to specifications. The standard sizes run all the way from nine feet eight inches by nine feet eight inches to 21 feet four inches by 28 feet four inches, and to accommodate from one to six cars. They also are made to house motorcycles, motor boats, etc. No

flooring is supplied, this usually being constructed of concrete, but substantially everything else is furnished, including a Yale burglar proof padlock and keys.

C. M. Smith, a theatrical man in San Francisco, Cal., recently left Los Angeles for New York City, as the result of wagers aggregating \$7500 that he would not reach the Atlantic port within 60 days. The machine is equipped with Miller tires, made by the Miller Rubber Company, Akron, O., and one of the wagers is based upon the ability of these tires to carry the car the entire distance without puncture or blow-out. Mr. Smith is accompanied by his wife and R. E. Hilton, the latter being official observer and representative of the other parties to the wagers. He expects to arrive in New York about Sept. 10.

The ministers of Lima, O., are planning a unique religious campaign in which motor cars will be used for pulpits on street corners, etc.



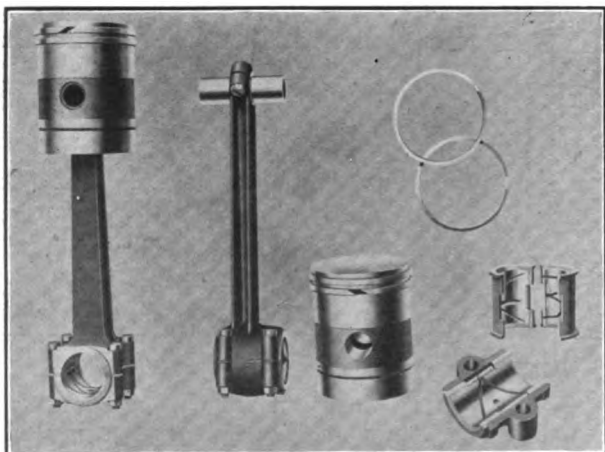
## CORRESPONDENCE WITH THE READER.

**Mercer Piston Rings.**

(1631)—Will you inform me as to the number of rings used on the piston of the Mercer cars, and the way the wristpin is secured?  
Waco, Tex., Aug. 15.

SUBSCRIBER.

The pistons of the Mercer motor differ from conventional practise in that only two rings are fitted, but the company points out that the design and method of fitting these members is one of the factors entering into the efficiency of the motor. The rings are placed above the wristpin, as will be noted by the illustration presented at Fig. 1. Instead of being turned eccentric they are the same thickness all the way around, then peined in a special machine which automatically provides an even tension at all points. In addition to improving the compression the construction makes for a lighter piston, which is of cast



**Fig. 1—Showing Two-Ring Piston Utilized in Mercer Motor and Method of Retaining Wristpin.**

iron, ground to size. The wristpins are hollow, of an alloy steel, hardened and ground, and oscillate in bosses. The piston attached to the connecting rod, also displaced and with rings removed, is shown in the illustration.

**Leaks in Pressure Feed System.**

(1632)—Some time ago I purchased a second-hand car having a pressure feed fuel system. I find it difficult to keep the pressure up to a pound even when the machine is running at good speed. Although it has been worked on by several repairmen, the results obtained are satisfactory for a short time only, and I have to use the hand pump every few miles. Can you suggest some remedy?  
Cranston, R. I., Aug. 11.

C. T.

With a pressure feed system it is essential that all joints and connections be perfectly tight. The fact that the pressure falls off rapidly indicates a faulty connection which probably vibrates loose, as the system worked satisfactorily after

it was overhauled and repaired.

An excellent method of locating the leak is to pump up the pressure to about two pounds and mix up a solution of soap and water. Apply the fluid with a brush to each joint and connection and note if any bubbles are given off. If any exist, disassemble the part and examine it, replacing with new if found faulty.

It may be that the check valves are dirty, especially if the system provides for utilizing the pressure of the exhaust gases. Remove the pipes and test them, also clean the valves. Generally, pressure feed systems have a regulating valve, adjusting which may cure the trouble, providing leaks are not discovered by the soap treatment. The check valves may be tested with gasoline. Excessive lubrication of the motor may be responsible for some of the trouble mentioned.

**Adjustable Valve Tappets.**

(1633)—Can you suggest some method whereby I can make my valve tappets adjustable? I have tried several devices advertised for this purpose, but have not had any success. The tappets are very noisy. Is there any method of eliminating the clatter?  
Bayonne, N. J., Aug. 13.

NEW READER.

The easiest repair would be to fit new parts, but this would involve more or less expense, depending upon the design of motor, which was not mentioned. Three methods of converting tappets into adjustable members, as well as making fibre inserts to eliminate noise, are shown at Fig. 2, and the suggestions may be of service.

The sketch at 2 shows a method of making a tappet adjustable. In this instance the tappet guide extended above the crankcase and the pushrod was of solid construction. The guide was shortened slightly and the tappet annealed to permit of cutting off a section, also to drill and tap a thread as illustrated. A hex set screw was screwed into the tappet and locked in the desired position by a lock nut. The head of the screw was recessed, as shown by the dotted lines, to take a piece of fibre. This material was placed in the screw member and hammered until hard, then smoothed up with a file. Of course, care should be exercised in reducing the length of the tappet, and the thickness of the screw member, lock nut and fibre insert must be considered. With this method it will not be necessary to reharden the tappet unless the temper has been completely drawn.

Another method of quieting a noisy tappet is shown at 3, which also depicts the fitting of a non-adjustable tappet, with means for setting.



Here the tappet is drilled, as shown by the dotted lines, and the fibre turned for a drive fit and forced into position, after the material is trued up with a smooth file. This method is preferable where the head of the tappet member is larger than the diameter of the valve stem, and where the latter strikes in the centre of the tappet.

While at first glance it would appear that on some types of motors, there is insufficient space to permit of the addition of a set screw and locking nut, it usually can be accomplished by cutting off the pushrod bushing, if it extends above the crankcase wall, or by shortening the rod or valve stem and valve spring. This can be determined by measurement. If there be space enough it will only be necessary to remove the pushrod and bushing or guide, and to treat these members

make the work easier. Start with the top ring, removing this member by slipping it over the tin strips. The other rings are removed in order. In replacing them the order is reversed, the lower ring being put on first. The rings should be replaced in their original positions.

#### Jacks for Car.

(1635)—Am using my machine but once a week, employing it to run between my country residence and the depot. I understand that it is best to jack up the wheels to save the tires. As it would involve some expense to buy jacks I would be pleased to have you suggest some method of constructing an inexpensive jack. Unless I am mistaken, you published an illustration of a home-made jack some time ago, but I cannot find it in my files of The Automobile Journal.

F. E. T.

Charlestown, R. I., Aug. 17.

The article referred to was published in the issue of The Automobile Journal for Jan. 25, in

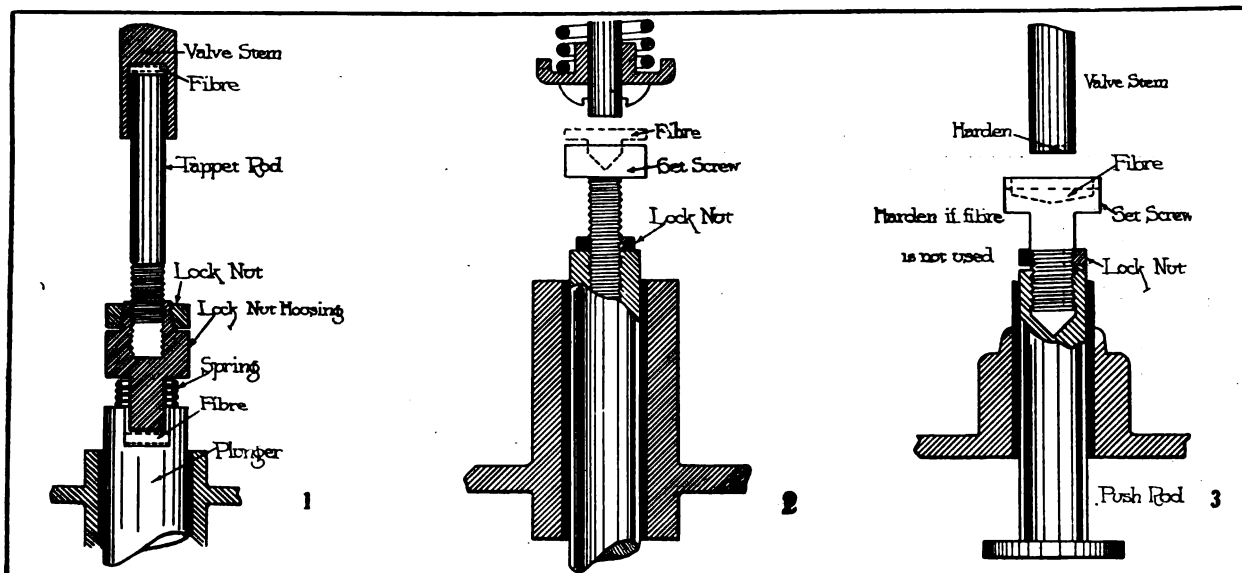


Fig. 2—Illustrating Methods of Inserting Fibre in Tappets to Eliminate Noisy Action, also Plan of Converting Tappets into Adjustable Members.

as described. Drawing at 1 shows another method. In this instance small discs of fibre were inserted in the plunger or tappet and the valve readjusted. After inserting fibre and running the car for some time, it will be necessary to readjust the tappets, as the fibre will be contracted more or less by hammering of the valve stems.

#### Displacing Piston Rings.

(1634)—What do you consider the best and safest method of removing rings from a piston?

Baltimore, Md., Aug. 16.

AMATEUR.

The removal of piston rings requires care, as they are very fragile and easily broken. There are several devices marketed for the work, but the writer favors using strips of tin. These are cut to suit the piston and inserted between it and the ring. Three will serve, but four will

the serial on equipping the private garage. The axle support or jack is reproduced at Fig. 3 and is made easily by following the working plan. Two-by-four joists are utilized, six pieces being required. The first step is to cut two members and fasten together as shown at A. The member B is recessed at one end, as indicated, and the wheels measured to provide for the proper height. This may be accomplished by measuring from the centre of the hub cap to the ground and adding about three inches, so that the tires will clear the floor when the supports are placed in position.

Four of these supports are necessary, one for each wheel, and when the chassis is raised from the floor they not only relieve the tires from all weight, but will be decidedly handy when working on the steering gear, motor bearings, etc.



The plan of jacking up the car when not in service is to be recommended.

#### Second-Hand Cars.

(1636)—Am contemplating buying a second-hand automobile and read the advertisements very carefully. I note that second-hand Fords, model T, are scheduled at prices considerably out of proportion to their cost; that is, the seller asks within \$200 of the first cost. I note that a number of other makes which originally sold for \$2000 and \$3,000, for example, can be bought for less than one-quarter of the first cost. Why is it that a Ford car brings more money second-hand than the machines mentioned? Is it because it is a better car and the others are not as good?

Boston, Aug. 16.

BUYER.

The law of supply and demand, especially the latter, may be applied to the point in question. The price obtained by any make of second-hand car depends largely upon the demand, and according to dealers in second-hand machines, there is a ready market for the Ford product; in fact, some dealers advertise for these. The

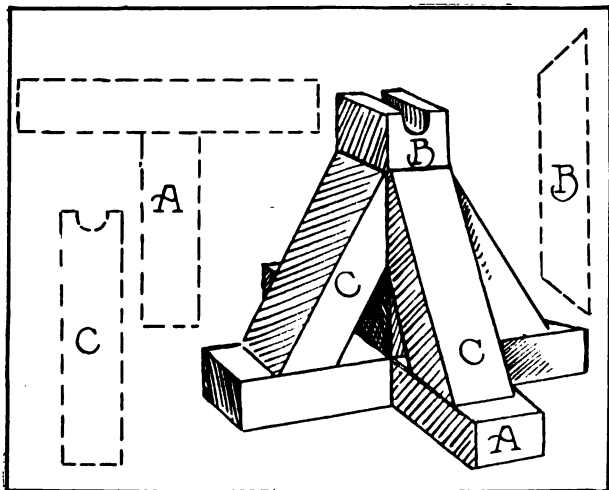


Fig. 3—Working Plan of Support for Axles When Car Is to Be Jacked Up.

other cars mentioned are listed at a low price because they do not find a market as readily as the smaller machine. It will be noted that there are always certain makes which are valued higher by a second-hand dealer than machines originally listing at the same price and more. This is largely due to the fact that there is a greater demand for the first-named cars.

#### Warren-Detroit Parts.

(1637)—Are there any companies manufacturing parts for the Warren-Detroit "30"? I understand that the concern is in the hands of a receiver.

Media, Penn., Aug. 11.

R. A. H.

The plant of the Warren Motor Car Company was sold at auction to W. C. Rands of the Rands Manufacturing Company, Detroit. It is possible that parts could be obtained from this concern,

or information secured as to where they could be purchased.

#### Spark Plug Troubles.

(1638)—Am having considerable trouble with the spark plugs in my motor, which is of the T-head type. The ignition system is a double one—batteries, timer and a coil for the plugs over the exhaust valves, and a true high-tension Bosch magneto for the intake valve plugs. The latter give but little trouble, but those over the exhaust members get badly sooted and covered with oil. This makes it difficult to start the motor, as I cannot spin it on the magneto. As a result I have to keep cleaning plugs. A repair man says I am using too much oil, which may be true, but I do not dare to use less and am following the instructions of the car maker. Can you suggest any remedy?

W. K. A.

New Britain, Conn., Aug. 14.

The repairman is doubtless correct in his diagnosis—too much oil. It may be that the mixture is too rich, which with excessive lubrication would cause the trouble referred to. If the plugs over the exhaust valves foul rapidly and are covered with oil, it would indicate that too much lubricant were being used or that the grade of oil did not best meet the requirements of the motor. If the trouble is present in all cylinders, it may be assumed that the amount could be cut down with safety. If the plugs of the front cylinders do not give trouble, it may be assumed that the rings leak or the crankcase of motor is lower at the rear than at the front, causing flooding of the rear cylinders. Place the car on a level floor, remove the inspection plates and examine the height of the lubricant in the crankcase under first and last cylinders. This suggestion is made in the event the oiling system is of the splash type.

The proper location of the spark plug is important; that is, the gap should not extend too far into the combustion chamber or be pocketed. By running the motor on the battery a few minutes before stopping the car may burn off the deposits on the plugs, and make starting much easier. Difficult starting is not always due to the plugs.

Six weeks of touring in Europe over 3000 miles in Italy, France, England and Wales was a journey recently completed by F. H. Wellcome, of Minneapolis, Minn., in a White seven-passenger touring car. Mr. Wellcome was accompanied by five passengers and a chauffeur, and his car carried six suit cases in addition to a trunk in the rear. Speeds as high as 65 miles an hour were made on some of the fine roads in southern and central France. The longest day's run was 175 miles, crossing the mountains between Avignon, on the Rhone river, and the town of Ambert. Mr. Wellcome reported that no trouble had been experienced throughout the entire journey.



## WITH THE MOTORING INTERESTS ABROAD.

### Bablot Takes the Sarthe Cup in a Delage Car---New Electric Motor Starter Recently Produced in Great Britain---Argyll's Comparative Fuel Test.

**B**ABLOT, a well-known French driver, won the 336-mile race for the Sarthe cup, under the auspices of the Automobile Club de France, Aug. 5. Bablot drove a Delage car, his time for the distance being 4:21:50, and his average speed 76:98 miles an hour. Guyot, who competed in the last 500-mile race on the Indianapolis speedway, driving a Sunbeam car of British make, was second in another Delage, his time being 4:26:30. Pilette, still another Indianapolis contender, was third, in a Mercedes, in 4:27:53. Five other cars finished in the following order: Salzer, Mercedes; Duary, Delage; Lautenschlager, Mercedes; Thoms, Schneider; Elashamp, Mercedes.

Just before the start of the race the two Peugeot cars which finished first and second in the Grand Prix of last month were withdrawn. Boillot and Goux, who drove these machines in the Grand Prix, were slated to pilot them in this event, which was held over the Amiens course. No reason was given for the action, but with these machines out of the running the event narrowed down to a contest between the Delage and Mercedes entrants. The latter was seen in a French road race for the first time since Lautenschlager won the Grand Prix of 1908. All of the cars which finished were fitted with Bosch magnetos, and seven of the eight used Bosch plugs.

#### LEYLAND PUMPING ENGINE.

#### Interesting Machine Built in England for Service in Shanghai, China.

Only a few years ago, the school geographies and books of travel did much to impress the gen-

eral public with the idea that conflagrations in China were fought with the old-fashioned hand cart, which was dragged through the streets, accompanied by a man beating a peculiar kind of drum. The accompanying illustration should help dispel this illusion, since this machine is the very latest type of gasoline pumping engine, made by the Leyland Motors, Ltd., Leyland, Lancashire, England, for the fire department in Shanghai, China.

The chassis is the standard gasoline model produced by this concern, although the company is somewhat better known as a manufacturer of steam carriers, having been engaged in that branch of the industry for many years. The



Leyland Gasoline Pumping Engine with Rated Capacity of 450 Gallons, for Service in Shanghai, China.

motor is a four-cylinder unit, with bore of five inches and stroke of 6.5, rated at 55 horsepower. This not only propels the machine, but drives the Reese-Roturbe rotary pump through a geared layshaft from the top of the transmission casing. The pump is of the four-stage centrifugal type and has provision for taking three lines of hose. It has a rated capacity of 450 gallons of water a minute.

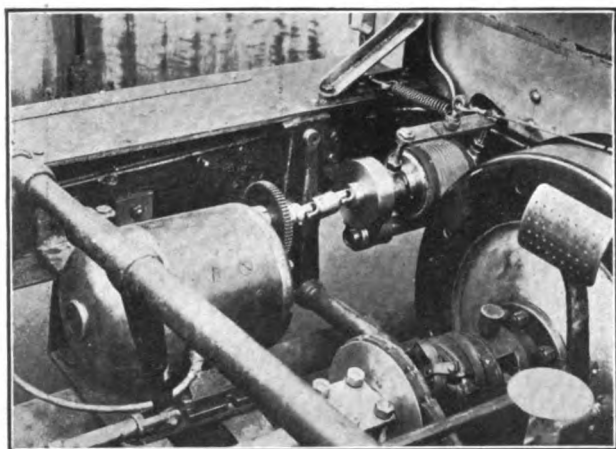
The equipment is complete in every way, provision being made for carrying a full crew of men, as well as a supply of regulation fire hose, ladders, etc.



## BRITISH ELECTRIC MOTOR STARTER.

**S**TATISTICS of the last Olympia show at London, England, revealed the fact that electric motor starting was not favored by the English manufacturer of accessories or equipment. It should be borne in mind that the purchaser is expected to buy his equipment, a practise decidedly in contrast to the methods in vogue in this country. In view of the attitude toward motor starters in England, the announcement of the United Motor Industries, Ltd., London, of an electrical unit is of interest.

The U. M. I. Magician starter, as it is termed, does not employ clash gearing, roller clutches or ratchets, nor is it permanently connected by means of gears or chains to the rotating parts of the motor. As will be noted by an accompanying illustration, a friction roller is moved into contact with the periphery of the flywheel of the engine through depressing a pedal, which also



U. M. I. Magician Electric Motor Starter, an English Design Utilising Friction Roller for Rotating Fly-wheel of Engine.

actuates a switch. Releasing the pedal cuts off the supply of current to the electric motor, the friction wheel oscillating back out of contact by means of a tension spring.

The motor is of .5 horsepower capacity, 10.5 by 6.75 inches, and is located as convenient on the chassis. Current is supplied by a 12-volt battery, and the motor rotates at about 2700 revolutions a minute. A reduction gear, reducing the speed to about 18:1, is utilized, and drive is taken through a shaft fitted with a universal joint connected with a free wheel. The friction roller is brought into contact with the periphery of the flywheel by means of a cable connection with the pedal. The crankshaft of the motor is rotated at about 150 revolutions a minute. Beyond

this rate, and when the motor operates under its own power, the friction wheel rotates idly because of the free wheel. A complete release of the pedal cuts off the current and the roller returns to normal position as explained above.

It is stated by the maker that the system is applicable to any gasoline car; that the shaft may be made any desired length, and that the friction roller may contact with any rotating part of the car engine. Another feature claimed is that it may be fitted without alteration to the power plant or transmission housing.

### COMPARATIVE FUEL TEST.

#### Interesting Demonstration with Argyll Sleeve Valve Car on Brooklands Track.

On the occasion of the recent visit of the Imperial motor traction congress to Brooklands track, England, an Argyll sleeve valve car, made by Argylls, Ltd., Alexandria, Scotland, ran a comparative test on gasoline and benzole. The model selected was a 15.8 horsepower roadster, a duplicate of the chassis which recently created world's records on the same track. The machine ran a half-hour on gasoline and immediately afterward another half-hour on benzole without adjustment or alteration.

It was arranged to maintain an average speed with a full complement of passengers, the object being not to make a speed demonstration, but to elicit figures which would interest the ordinary motorist. With gasoline, the distance covered was 15 miles, 3.5 quarts being used, and with benzole the distance was 15 miles, one furlong, the fuel consumption being 2.5 quarts.

### CREATES WORLD'S RECORDS.

#### British Humber Car Makes New Marks for Distances Up to 200 Miles.

An 11 horsepower Humber car, made in England, Tuck driving, recently created new world's records for its class on the Brooklands track, Weybridge, England. It already held the shorter distance marks in the British class B, which has piston displacement limits somewhat less than any American class. There are no American records for the smallest class (less than 160 cubic inches) for distances greater than 20 miles.

The Humber exceeded the records formerly held by an Arrol-Johnston for distances from 50



to 200 miles, and but for the failure of water circulation and a broken valve spring, it is assumed that it would have had little difficulty in making a new 300-mile mark. It also took the records from one to six hours, its performances being tabulated as follows:

| Miles | Time       | M.P.H. |
|-------|------------|--------|
| 50    | 46:08.80   | 65.01  |
| 100   | 1:28:56.02 | 67.47  |
| 150   | 2:13:56.71 | 67.19  |
| 200   | 2:57:05.57 | 67.76  |
| Hours | Miles      | Yards  |
| 1     | 66         | 286    |
| 2     | 136        | 134    |
| 3     | 203        | 546    |
| 4     | 272        | 1606   |

#### NEWS NOTES FROM ABROAD.

At the completion of the new transportation building at Hastings park, Vancouver, B. C., it will be opened Aug. 30, with an automobile show.

It is announced that the international automobile convention has been ratified by the government of Montenegro and that international travelling passes are now valid for cars touring in that country.

For the last three years the annual export of ball bearings from Goteborg, Sweden, to the United States has increased at a remarkable rate, the values being \$12,042 in 1910; \$35,000 in 1911, and \$196,705 in 1912. A great deal of the machinery used in the manufacture of these bearings is of American make, including the gas forges, lathes and grinders.

An American consular officer in a European country reports that a well-known representative of various machinery houses desires to secure the agency for a first-class American automobile. He wishes to correspond with manufacturers and only those who build cars upon a large scale. Information may be obtained of the bureau of foreign and domestic commerce, Department of Commerce, Washington, D. C., by referring to file No. 11,453.

The members of the British Institution of Automobile Engineers who took part in the recent visit to the United States have now all returned to England. A paper will be read at the November meeting of the Institution embodying the result of the observations of the various members of the party, and it is expected that several members of the American Society of Automobile Engineers, who will be in London on a visit to the motor show at Olympia, will be present at the meeting to take part in the discussion.

The various city departments of Birmingham, England, own and use 28 motor cars, which cost, with accessories, \$58,656, or an average of \$2093 each. The estimated yearly cost of running, including wages, uniforms, etc., is \$14,133. Including depreciation, the total cost is calculated at \$32,518 a year, or an average of \$1161 for each car. It is calculated that these machines average 9434 miles each and cost 12 cents a car-mile. They have displaced seven men, six horses and nine vehicles at an annual saving of \$7619.

The Royal Automobile Club of England announces that the next Tourist Trophy race will be held in the Isle of Man in June, 1914. The regulations will be issued shortly. These are to be in accord with the views of the club and the Society of Motor Manufacturers & Traders and have been approved under the bond of the society. The race will be a two-day event for cars fitted with four-cylinder internal combustion engines, about 300 miles being run each day. The rules call for stock cars, with minimum wheelbase of 108 inches, tread of 54 inches, body width, 40 inches. Any kind of fuel will be permitted, a sample of which must be furnished to the club 14 days previous to the race.

A daily motor service has been inaugurated between Huelva, Spain, and Ayamonte, a town on the Portuguese

frontier, whence connections may be had for the southern railways of Portugal. The distance is 37 miles, and at present but one trip is made daily, although this may be increased. Hitherto the only means of transportation has been by stage coach, and the new service doubtless owes its installation in part to the efficient, popular and profitable operation of a similar line between San Fernando, near Cadiz, and Algeciras, Spain.

The Coupe de l'Auto race will take place on the Boulogne circuit, Sept. 21. The entries closed July 31, but additional entries will be received until Aug. 31 on the payment of double fees. Two cars have been entered by the Sunbeam Motor Company of England, and in addition to the Sunbeams there will be three Peugeot machines, one driven by Bollot and the other by Goux; four Koechlin cars, one of which will be piloted by A. G. Koechlin, and three Th. Schneider machines, the drivers of which are not named. There also will be two cars each of Delage and Zenia makes, the drivers specified for the former being Guyot and Babilot, and for the latter, Guyot and Briard.

#### INTERNATIONAL AVIATION RACE.

##### Weymann and Kantner Expected to Represent America—Rules for 1914.

While the Aero Club of America has until 24 hours before the running of the fifth international aeroplane race for the Gordon-Bennett cup at Villacoublay, France, Sept. 29, it is pretty generally conceded that Charles Terres Weymann, winner of the third race, and Harold Kantner of Meadville, Penn., will represent the United States. Each country is entitled to three representatives. Weymann flies a Nieuport monoplane, while Kantner is now abroad engaged in the construction of a Kantner-Moisant monoplane for this flight.

An important conference of the Federation Internationale Aeronautique was held recently in Scheveningen, Netherlands, at which America was represented by Cortlandt Field Bishop, Charles Terres Weymann, Campbell Wood and Dr. Eberhardt. The object of the meeting was to consider rules for the sixth international race in 1914. Mr. Weymann suggested that competitors be required to pass a preliminary test consisting of a straight flight over a course of two kilometers and return, the speed to be taken both ways, the result to be a mean speed of not more than 70 kilometers (42 miles) an hour. This test is expected to demonstrate the safety of the machine. The suggestion was adopted.

The federation also ratified the draft of the treaty regulating international aerial traffic adopted at the Brussels meeting, and a committee reported that the Belgian government had forwarded the treaty to the French government with the request that it consider the desirability of calling an international conference to consider the subject.



## MOTORIZING LAWS AND THEIR ENFORCEMENT.

Connecticut Press Expresses Its Views on New Universal Lighting Statute—Patent Association Enters Protest Against Oldfield Bill in Congress.

CONNECTICUT has a new law covering the use of lights on all vehicles using highways during the hours of darkness. Connecticut is the "Land of Steady Habits." The new law exempts vehicles without springs, in which respect it differs somewhat from similar statutes in other commonwealths. In some other respects, the new requirement is meeting with the same objections as those which have prevented the enactment of such safe and sane legislation in other sections. The new law went into effect Aug. 1, and reads as follows:

All vehicles, other than motor vehicles, having springs or rubber tires while in use in the public streets and highways, except highways or portions thereof lighted all night by any municipality, shall show, from one hour after sunset until one hour before sunrise, a light or lights so placed as to be visible from the front and rear of such vehicles. Such light or lights shall be of sufficient illuminating power to be visible a distance of 200 feet. Any person driving or directing any such vehicle upon a public street or highway between the hours aforesaid without a light shall be fined not more than \$5. The court before which the accused is tried may suspend judgment or remit the penalty provided herein whenever in its judgment the circumstances will warrant such action.

It would appear that extreme care had been taken by the legislators to insure that no injustice should be done. It is of interest, however, to note the different views upon the subject held by the press of the Nutmeg State. Says the Hartford Courant:

Hereafter (automobiles being already covered by existing law) all vehicles on highways, if they have springs, must show lights, visible from front and rear at least 200 feet, from one hour after sunset to one hour before sunrise. Heretofore legislatures have refused any such law because the members from the country said it meant lights on haycarts. As the modern haycart has no springs and also is seldom out after dark, it follows that such are immune. But, when the hired man hitchies up the old mare to go and see his girl, he must rig a couple of lights or run the risk of a fine. This new law is the plainest sort of common sense. Maybe we shall some day have swimming set down as a compulsory course in our public school system. We're coming along, even if slowly.

The Hartford Courant is regarded as a very conservative organ in the "Land of Steady Habits." So also is the Ansonia Sentinel, which comments in this manner:

The new law requiring spring vehicles to carry lights will not be a very popular one hereabouts. In the first place, owners of such vehicles claim there is no need of such a requirement, except for vehicles equipped with rubber tires. The law already, and for a number of years past, covered that point. A vehicle equipped with steel tires inevitably makes sufficient noise to be heard approaching, even over the smoothest roads. There is little or no danger of them colliding with autos, motor-

cycles or other vehicles travelling at high speed, if the latter carry lamps as they are required to do, it is argued. Collisions between rubber-tired vehicles and those carrying steel tires do not happen as a result of darkness if the rubber-tired vehicles carry lights.

Still another view of the matter is taken by the Meriden Record, as shown by the following:

Such a law is but the natural outcome of the continual innovations in means of locomotion and transportation. It was absolutely necessary that hard and fast rules should be employed regarding lights on motor cars and with their increase the corresponding need of lights on horse-drawn vehicles became apparent. Life in general will be made more safe by the new law, and any opposition to it must result from short-sighted selfishness not capable of realizing the mutual benefit that must accrue.

### IOWA LAW A SUCCESS.

State Treasurer Reports That Over \$700,000 Was Collected During the Year.

"Iowa's automobile tax now amounts to nearly three-quarters of a million dollars a year," the state treasurer's office is quoted as saying, and by that same token it is taken for granted that the law passed in 1911 and amended in 1913 is a success. The total amount received from the registration of motor cars, under its provisions, for the year ending June 30, was \$711,229.07, of which \$520,464.74 was collected since Jan. 1. The number of automobile registrations for the year was over 63,000.

The Iowa law provides a registration fee of \$8 for cars of 20 horsepower and under, and 40 cents a horsepower for larger machines. Eighty-five per cent. of the money so raised is distributed among the various counties as a county motor vehicle road fund. The state highway commission gets eight per cent. and seven per cent. goes to the office of the state treasurer to pay the expenses of handling the money. This means that the motorists of Iowa have contributed \$604,544.71 for road construction during the past year.

### FOR UNIFORM LEGISLATION.

Convention of Officials Interested to Be Held in Montreal, Canada.

In view of the widespread interest in uniform motoring laws, it is anticipated that this subject will be discussed at some length before the an-



nual meeting of the commissioners on uniform state laws, to be held in Montreal, beginning Aug. 26. Every state in the Union is to be represented by three or more commissioners appointed by the governor, and while all phases of uniform legislation will be considered, it is announced that motoring will find a prominent place on the programme.

Charles T. Terry, president of the Uniform Law Commission, with headquarters in New York City, has been working actively for years toward securing greater uniformity in automobile matters. As chairman of the American Automobile Association's legislative committee, he drafted the federal automobile bill, which was introduced into Congress a few years ago. Mr. Terry will represent the commission of which he is the head and will take an active part in bringing the subject of motoring laws before the convention.

### PATENT BILL OPPOSED.

#### Patent Law Association of Chicago Presents Statement to the Senate.

A thorough statement prepared by the Patent Law Association of Chicago has been presented to the Senate at Washington by way of comment upon the Oldfield bill for revision of existing patent laws. Naturally, the statement is somewhat lengthy, covering as it does the many features of the situation. After citing the alleged evils of the present patent system and the suggestions for their removal, the association submits what it believes to be satisfactory arguments against these features of the bill. Particular objection is made against the proposition for compulsory licenses and the elimination of retail price restrictions. Considering the former the statement is in part as follows:

The Oldfield bill provides for compulsory licenses, the avowed object being to prevent the shelving of competitive patents. The theory of the amendment seems to be that an inventor may hold more than one patent relating to the same subject matter so long as he does not contract or agree with others to suppress one or more of his patents. The report justifies this by an argument that the inventor is presumably meritorious and impecunious, and must enlist outside aid to bring his inventions before the public, but assumes that the assignee of a plurality of patents relating to the same industry is attempting to create a monopoly of monopolies and that such ownership is without justification. Of course, the bill ignores a large class of cases where the inventor himself takes out numerous patents relating to the same industry and manufactures under some, but not all, of them. It does not operate against the individual patentee unless and until it has been shown he has agreed with some one else to suppress one of his patented inventions or that he is suppressing a competitive patent acquired by assignment from another.

\* \* \* \*

As to the compulsory license feature of the bill, we do not find from the evidence adduced before the House

committee, nor from any other source of information, sufficient justification for a resort to this scheme, which is wholly antagonistic to the basic principles of the American patent system.

The Oldfield bill, in providing for compulsory licenses, seeks to introduce the idea of a working requirement; but does it by indirection, possibly because of the apprehension that a direct requirement would be unconstitutional.

Regarding price restrictions, the following argument is set up:

If a patentee has a monopoly in the making, using and selling of an article, and has the right to suppress the invention wholly and to exclude others wholly, it follows that he has the right to suppress it in part or to admit others on such terms and conditions as he may fix. Of course, it may be argued that under the constitutional provision it is still within the province of Congress to fix conditions and limitations affecting the exclusive right which the constitution mentions, but the reasoning of all of the decisions up to the present time points to the conclusion that when the constitution used the word "exclusive" it meant just that, and that the constitutional provision could not be avoided by fixing conditions and limitations upon the exclusive right which impaired or lessened its scope. This, of course, does not mean that patent property like other property is not subject to other provisions of the constitution and to the laws of the land, as for example to the police power of the states and the laws relating to the conservation of the public health and the public morals. But the provisions of the Oldfield bill, at their face value, take away from the owners of patented property the right of contract which is enjoyed by owners of unpatented property. We can not see any justification for prohibiting the patentee from fixing in the terms of his contract as one of the conditions of a license the price at which the article shall be resold, if that be necessary to the preservation of his monopoly and if the restriction be imposed as a condition of the license.

### AUTOMOBILE CUSTOMS FIGURES.

#### Interesting Statistics for the Port of New York During the Past Decade.

Statistics prepared by the New York custom house for the period of 10 years ending June 30 last, show that from the port of New York there were exported 40,062 American cars, valued at \$47,069,641. Imports of European cars for the decade numbered 8774, appraised at \$22,507,615. Manufacturers of American machines sent out of New York for foreign use five times as many automobiles as were received from European makers. Unfortunately the bureau of statistics at the New York port has no figures dealing with the number of machines exported during the first three years of the decade, although their valuation is available. One authority at the custom house thinks that perhaps 2000 machines were exported during 1904, 1905 and 1906. This would make the exports for the decade over 42,000 cars.

The official report shows that during the fiscal year ending June 30, 14,383 machines, valued at \$13,122,218, were shipped from the New York port. The statistics for the three preceding years are: 1912, 11,468 machines, valued at \$10,216,162; 1911, 6010 cars, worth \$6,397,307; 1910, 3275 automobiles, valued at \$5,151,428.



## IN THE COMMERCIAL VEHICLE FIELD.

### Some of the Newer Developments Among Motor Driven Farming Implements---Hauling Milk Long Distances by Mechanical Transport--Road Oiling Work.

**B**ECAUSE of the success which has attended the use of tractors on the large farms of the West and Northwest, several designers have been busy in the effort to produce similar equipment adaptable to many different kinds of work in order to take the place of horses and have the same utility on the small farm. This has resulted in the recent announcement of at least three decidedly new developments in the automobile industry.

The Parker motor plow is the invention of Joseph N. Parker of Bedford City, Va., and is the result of experimentation covering a considerable period. The Parker Motor Plow Company of that city has been organized by three brothers, for its production, it being maintained that its practicability has been demonstrated in sod, soft ground, loam and sand.

The chief feature of the invention lies in the method of control, the operator walking behind the plow, or harrow, cultivator, wheel hoe, seeder, etc., as when horses are employed. In addition, fittings are supplied with which it is possible to utilize the motor as a stationary engine.

The whole equipment is light and easily managed. The control mechanism is located on the handle so that it is possible instantly to throw the motor out of engagement, lift the machine over any obstruction and as readily replace it in operation again.

The motor is a two-cylinder, air-cooled, nine horsepower motorcycle type, and is installed midway between the frame side members over the working attachment. Ignition is by Bosch magneto. This engine drives, by shaft and gear reduction, two spiked wheels, and it is claimed that the suction created by the plow holds these driving wheels to the ground and that the spikes prevent them from slipping.

The Holmes Tractor Company, Port Clinton,

O., has brought out the Holmes Little Giant tractor, which is designed for the orchardist, the man with a small farm or anyone who has use for a machine that will do the work of four horses. The motor is a Dice two-cylinder, opposed unit, rated at 12 horsepower. The bore of the cylinders is 5.5 inches and the stroke five. Cooling is by water, the capacity of the system being 40 gallons. Lubrication is by mechanical oiler and splash. Jump spark ignition is employed, utilizing batteries and coil. The Schebler carburetor is supplied from a tank of 25 gallons capacity, and the motor is governed to a predetermined speed.

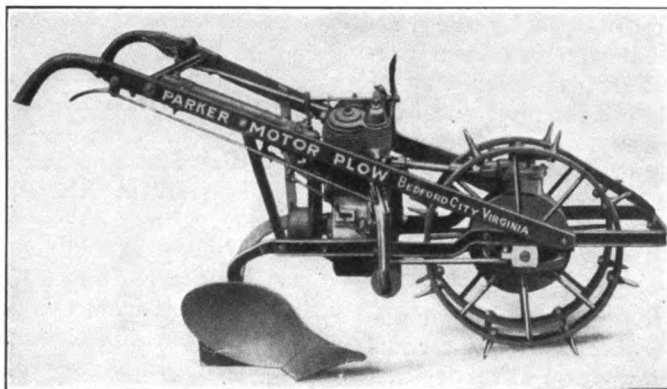
The planetary type of transmission is used, affording two speeds forward and reverse. The low speed is utilized only for starting and turning in close quarters, it being maintained that the machine can be turned in

a 24-foot circle. The high, or working speed, is rated at from 1.5 to 1.75 miles an hour. Drive is taken from the transmission to a differential gear by a jackshaft, the final drive being by chain.

The frame is of steel channel, braced and hot riveted at the corners and cross members. The rear

end of the frame, which carries the greater portion of the weight, is spring mounted. The front axle is fitted with the automobile type of steering knuckles and is pivoted at the centre to allow for unevenness of the ground without twisting the frame. The front wheels are 36 inches in diameter with five-inch face, and the rear members 78 inches diameter with 10-inch face. The height over all is 54 inches, width six feet and length 11 feet six inches. The weight complete is 4060 pounds.

A machine that is distinctive in appearance, at least, is the Detroit tractor, made by the Detroit Tractor Company, 807 Scotten avenue, Detroit. Perhaps the chief feature is the method of control, this being by means of reins, three of which



Parker Motor Plow Utilizes Twin-Cylinder Motorcycle Engine.





**Holmes Little Giant Tractor in Orchard Work.**

are held to be all that is necessary, although a fourth is added to operate the brake when the tractor is to be used in hilly countries. Steering is accomplished by a pull on either the right or left steering rein, which connects the engine by a special friction clutch to the steering gear. A very slight pull is said to be all that is required to make a complete turn. A pull on both steering reins simultaneously releases the main clutch in the engine flywheel, thus stopping the tractor. The third rein is used only to shift the gears from neutral to forward or back.

The main frame carrying the engine and gears is a semi-steel casting. The engine is made especially for this company by the Continental Motor Manufacturing Company of Detroit. It is a four-cylinder, four-cycle, water-cooled unit of the L head type, with bore of 4.125 inches and stroke of 5.25, giving it a rating of 27.25 horsepower under the S. A. E. formula. Lubrication is by a positive plunger pump system with constant oil level, all enclosed within the crankcase. Cooling is aided by a radiator of special design, of the vertical fin tube type. Ignition is by Bosch high-tension magneto. The carburetor is designed to vaporize gasoline, kerosene, distillate and low grade fuel oils, although gasoline is used for starting. The capacity of the fuel tank is 30 gallons.

The clutch is a 16-inch leather faced cone, and power is transmitted through direct gears, two spur gear reductions being all that are required between the crankshaft and the driving wheels. A separate oiling system is utilized for the bearings and gears, when the tractor is in motion. The main axle is

solid, of 2.5-inch cold rolled steel, and the driving wheels are made with wide, flat grouters, which are held not to injure the finest road surface. For field work, detachable cones are furnished, which give the wheels the proper tractive power in soft ground. Extension rims are supplied when desired. The speed of the tractor is given as from 2.5 to four miles an hour.

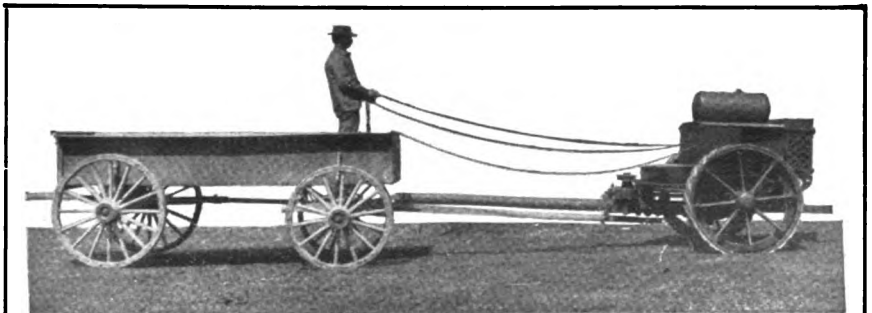
### NEW TAXICAB REGULATIONS.

#### Enforcement of Ordinance Delayed at Last Moment by Injunctions.

Aug. 1 had been set by the board of aldermen in New York City as the date upon which the new ordinance affecting taxicabs was to go into effect. But at the last moment, 10 temporary injunctions were secured, restraining the police department from enforcing its provisions. As a result of this movement, but 30 of the 2800 taxicabs were operating under new licenses Aug. 1.

The ordinance in question seeks to abolish the private taxicab and hack stands at hotels and other buildings, and to reduce fares very materially. Those who secured temporary injunctions were: The Yellow Taxicab Company, operating over 600 taxicabs; Mason & Seaman Company, 600; Haverty's Cab Company, 50; Universal Taximeter Company, 50, and the New Taxicab & Auto Company, 40. The list does not include the Independent Taxicab Owners' Association, representing some 500 individual cab owners.

In addition to the other provisions, the ordinance requires taxicabs to be licensed, after the meters have been inspected and found satisfactory. Taxicabs also are required to display a rate sheet containing the new list of fares, and the meter must be so regulated as to show the exact fares under this rate sheet. The five companies which sought relief in court maintain that the new rates are confiscatory and they raise ob-



**Detroit Tractor, Steered by Reins, Attached to Farm Wagon for Road Use.**

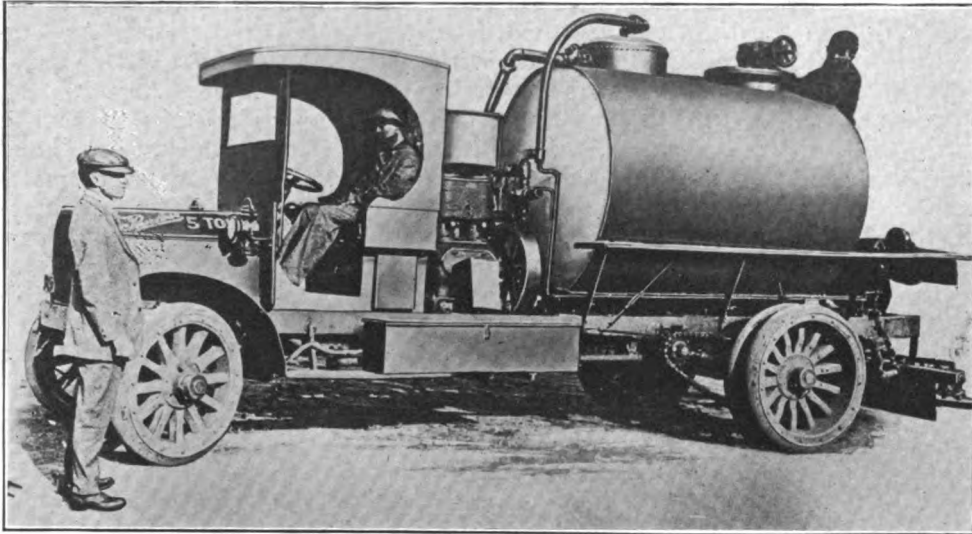


jection to the section abolishing the private hack stands. In this latter matter they have the cooperation of the Hotel Men's Association, but not of the Independent Taxicab Owners' Association.

### PEERLESS IN ROAD OILING WORK.

#### Problem of Hauling Heated Material Long Distances Is Solved Effectually.

The problem of applying oil to the road surface at a distance of 20 miles or more from the starting point and to spread the material at a heat of 200 degrees or over, is one which has been solved effectually by the road commissioners of Los Angeles county, California, by the use of a Peerless five-ton truck, made by the Peerless Motor Car Company, Cleveland, O. As will be



Peerless Five-Ton Chassis Equipped with Special Body for Handling Heated Road Oil.

noted by the accompanying illustration, the body has been especially designed for the purpose.

The chassis is fitted with a 1000-gallon oil tank, and the latter is covered with a coating of asbestos two inches thick. Oil is run into the tank at a temperature of 350 degrees, Fahrenheit, and, thanks to the heat-retaining quality of the asbestos protection and the speed at which the truck may be driven, it is possible to cover as many as 35 to 40 miles before the oil is too cold for use.

Air pressure of 60 pounds to the square inch is maintained inside the tank by an air compressor operated by the same mechanism as that used to actuate the dumping body for sand and gravel utilized with Peerless trucks. Heat from the motor exhaust is utilized to keep the oil spreader warm so that the material will not thicken and clog up at that point.

### HAULING MILK BY TRUCK.

#### Springfield Dealer Saves Between \$8 and \$9 a Day, and Improves Service.

An interesting example of the economy and efficiency that can be experienced through the use of the mechanical transport in the milk business is that reported by Charles A. Nash, Springfield, Mass. Five years ago he was able to supply his customers among the families of Springfield with bottled milk by three one-horse teams. Today, seven such wagons distribute 3300 quarts of milk and 125 quarts of cream daily.

Practically all of Mr. Nash's supply comes from Gilbertville and Old Furnace, in Worcester county, the former being approximately 33 miles from his plant on Oakland street in Springfield.

Before the purchase of the Alco five-ton truck, this milk was collected from the two stations named and brought to Springfield by train. Its arrival at the freight house depended upon the arrival of the train and the amount of freight it was able to pick up on the road. A contractor was employed to bring it from the freight house to the bottling plant.

Now, one man leaves the Oakland street plant with a truck load of empty cans every morning at 4:30, Sundays included. He drives directly to Gilbertville, where he finds the farmers awaiting his arrival. The wait at this point averages about 20 minutes. Then follows a drive of 4.5 miles to Old Furnace, where the same plan is followed, necessitating a wait of about 15 minutes. The 28.5 miles between Old Furnace and Springfield is covered before 1 or 1:30.

The old plan of bringing the milk to Springfield by train and conveying it to the Oakland street plant by contractor occasioned an average daily expense of \$21, this including a freight charge of five cents a can each way. Mr. Nash says that the daily expense of the truck, including the wages of the driver, averages between \$12 and \$13.



### USED MOTZ CUSHION TIRES.

#### That Is the Reason C. W. Crawford Had No Punctures on Transcontinental Trip.

C. W. Crawford of Los Angeles, Cal., recently arrived in New York City after having completed a transcontinental tour without a single puncture. Mr. Crawford drove a five-passenger gasoline car equipped with Motz cushion tires, made by the Motz Tire & Rubber Company, Akron, O. The trip occupied practically 20 days of actual driving.

The route selected lay through the mountains of the southwest, and for some distance in Mexico. For 1500 miles, from Pamo, Cal., to Santa Fe., N. M., almost impassable roads were encountered. In fact, in some places there were no roads at all, in the generally accepted use of the term.

In order to follow the mapped course it was nothing unusual to cross rivers by the way of railroad trestles. Quite often streams or shallow rivers were forded. Several times it became necessary to extricate the machines from sand hub deep, and often the services of a team of mules were required. Small boulders and sharp stones afforded plenty of opportunity to demonstrate the value of the Motz cushion tires, and Mr. Crawford is emphatic in the opinion that they are great time savers, when compared with the use of pneumatics under such circumstances and conditions.

### SHOW DATES SELECTED.

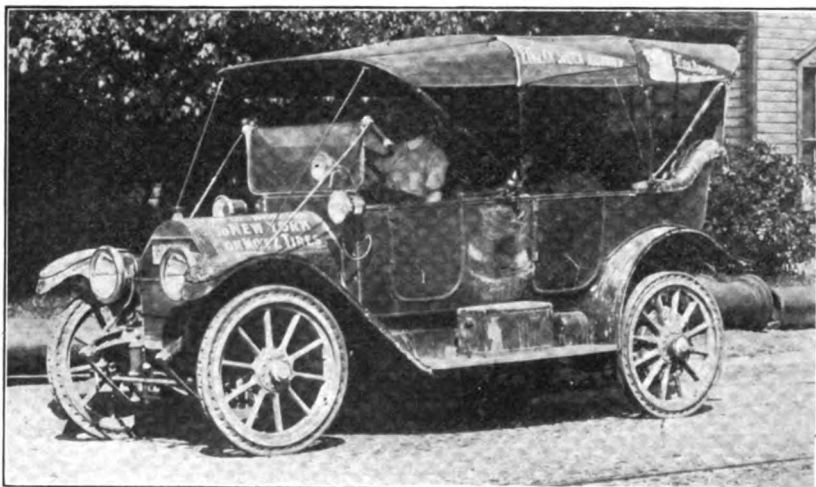
#### Automobile Chamber of Commerce Decides on New York and Chicago Events.

Announcement is made that the national automobile show in New York City will be held in the Grand Central Palace, Jan. 3-10, and that in Chicago in the Coliseum, Annex and First Regiment armory, Jan. 24-31. Both events will be held under the auspices of the Automobile Chamber of Commerce, of which S. A. Miles is general manager. This will be the first time that the New York and Chicago displays have been held under the same management since the so-called Selden patent litigation divided the indus-

try in 1905. Both shows will be for pleasure cars only.

Four floors of the Grand Central Palace will be utilized for the New York exhibition. Automobiles will be shown on the first and second floors, and in the wall spaces on the other two floors. Members of the Motor & Accessories Manufacturers will have their first choice of the accessory booths on the third floor, while accessory makers and jobbers not members of that organization will be permitted to make display in connection with the motorcycle section on the top floor. The total available show space in the building is estimated at 50,000 square feet.

The plans for the Chicago display call for increasing the exhibition space in the Coliseum, by extending the gallery at the sides and ends, adding 5000 square feet. The greater portion of the



C. W. Crawford and the Motz-Equipped Gasoline Car with Which He Crossed the Continent from Los Angeles to New York.

main floor of the armory will be devoted to the exhibition of electric vehicles, as was the case last season.

George B. Sickly, a rural free mail carrier in the Devil's Lake country in Michigan, starts and stops his Buick car 125 times in every 25 miles, every day in the week except Sunday. His speedometer shows 4000 miles, which means a total of 20,000 stops. He kept account of his gasoline for 900 miles and found he used 50 gallons, or an average of 18 miles to the gallon. He reports that the repeated gear shifting has not resulted in any more wear and tear on tires or machinery than in ordinary driving.

Collections of motor car taxes for the first half of the year in Alabama show an increase of \$10,000 over the same period last year.

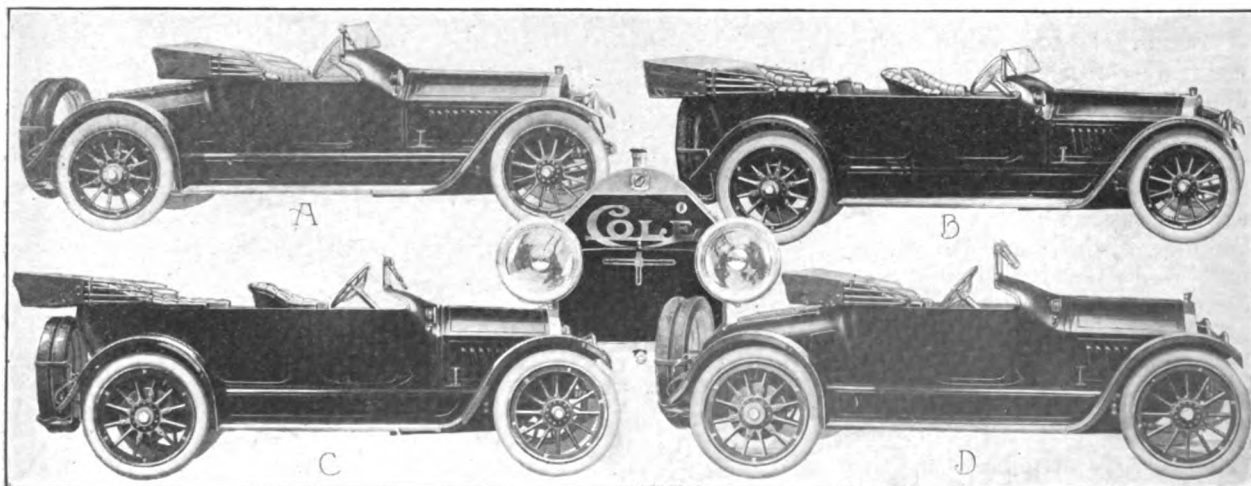


## COLE STANDARDIZES SERIES NINE MODELS.

**S**IMPLIFICATION and standardization are features of the Series Nine announced by the Cole Motor Car Company, Indianapolis, Ind., maker of the Cole cars. This is particularly true of the power plant, the twin cast cylinders of both the four and six-cylinder models having a 4.25-inch bore and 5.25-inch stroke. The former models, the Series Eight, comprise two similar designs, a 40 four-cylinder and a 60 six-cylinder having a bore and stroke of 4.125 by 4.75 inches, respectively, and in addition a 50 four-cylinder with a bore of 4.5 inches and stroke of 5.25. An increase is noticeable in the horsepower of the two new chassis, especially the larger, which is said to develop 68. The adoption of a standard power plant is in keeping with the policy of the

the small end is fitted with a one-inch diameter phosphor bronze bushing. The split white bronze bushing at the large end is 2.125 inches in diameter. Both bearing surfaces are 2.25 inches long.

The camshaft of the four-cylinder motor is driven by helical gears, but a silent chain is utilized on the six, it being pointed out that a chain can be used to advantage and that a practically uniform torque is provided. Tungsten steel valves are employed, these being located on the left side of the motor and actuated by the roller type of adjustable pushrods, operating in cast iron guides pressed into the cylinder casting. The valve mechanism is enclosed by quick detachable plates. The practise of providing an in-



**Members of the New Cole Family or Series Nine: A, Six-Cylinder Roadster; B, Same Chassis Fitted with Seven-Passenger Touring Body; C, Four-Passenger, Four-Cylinder Touring; D, Four-Cylinder Roadster—The Cylinder Dimensions Are Identical and Standardization of Parts and Dimensions Are Noticeable.**

company, and is of distinct value to the purchaser.

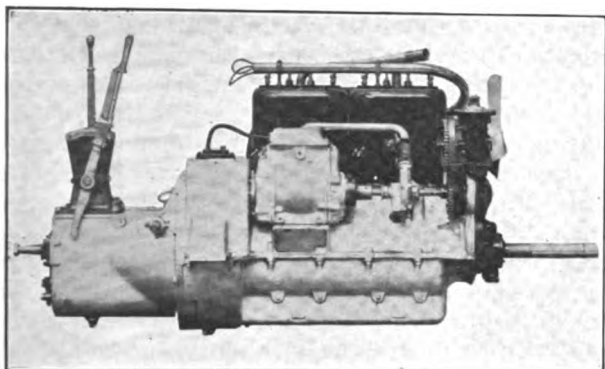
The unit power plant and three point principle of suspension is continued, the front end being supported on a trunnion and the other two points being arms cast integral with the flywheel housing. The bracket carrying the Delco motor-generator is also cast integral with the crankcase and is located on the right hand side. The crankshaft is a drop forging of a high-grade alloy steel, heat treated and accurately finished by grinding all bearings to very close limits. Three bearings are utilized on the four-cylinder motor and four on the six, these being die castings of white bronze and having shims for making easy and accurate adjustments. The connecting rods are also drop forged from a special alloy steel, and

specification plate and marking the flywheel for checking valve timing is continued.

Carburetion is by a Stromberg, located in an accessible position on the left hand side of the motor. A pressure fuel feed is employed, a small adjustable air pump being fitted to the left hand side of the power plant and actuated by an eccentric on the camshaft. The gasoline tank is suspended at the rear of the chassis and has a capacity of 22 gallons. The method of suspension is indicated in an accompanying illustration. The intake manifold is well designed, and that on the six-cylinder model has a water jacket to eliminate condensation of the mixture, as well as to assist in the vaporization of low-grade fuel.

The constant level splash and pump circulation of lubricant is continued, its efficiency and





**Motor of the Cole Four-Cylinder Model, Showing Location of Motor-Generator and Three Point Suspension.**

economy with absence of smoking having been demonstrated in service to the complete satisfaction of the company. The adjustable pump is actuated by a spiral gear on the camshaft, drawing oil from the reservoir, forcing it through a sight feed on the instrument board, thence to the main bearings. Each connecting rod dips into an individual trough cast with the crankcase, and baffle plates prevent other than the desired constant level of the lubricant. All surplus oil is collected and led to the sump to be circulated again. The capacity of the smaller motor is nine quarts, that of the six-cylinder, 12. The construction and operation of the plunger pump was fully described and illustrated in a recent issue of *The Automobile Journal*. Ignition is by the Delco timer device, which has a governor for automatically advancing and retarding the spark in proportion to motor speed, and the conventional control is also provided.

The clutch is of the leather faced cone type, with six separate tension springs concentric with the clutch centre. The aluminum cone is 14.875 inches in diameter and 2.5 inches wide, with a 11-degree face angle. Gradual yet positive engagement, as well as easy release, are features emphasized with the construction. The clutch hub bearing is of the annual ball type and a ball thrust bearing is incorporated in the release mechanism. The clutch springs are mounted on a six point spider supported from the rear extension of the crankshaft, located between the fly-wheel and clutch proper. A leather brake or clutch stop is incorporated to prevent spinning when changing gears.

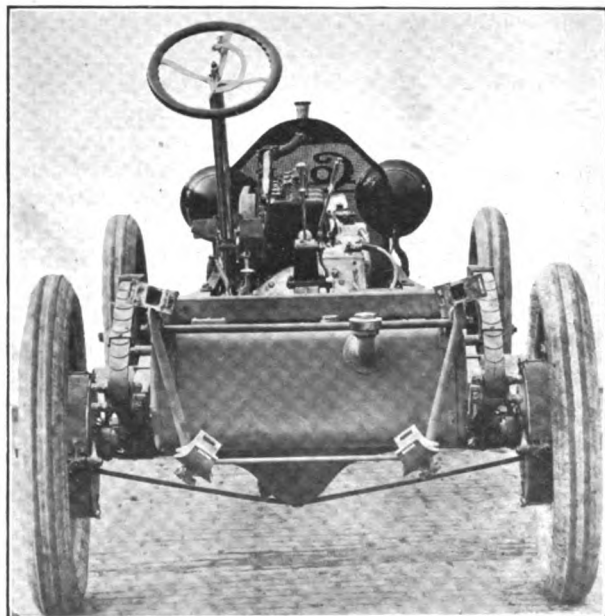
The selective type of transmission provides the conventional three speeds forward and reverse. The shafts and gears are made of chrome nickel steel and are mounted on annular bearings. A roller bearing is employed where the sliding gear shaft floats in the clutch shaft extension. The speed ratios obtained by the transmission

are: High, 1:1; intermediate, 2:1; low, 3.65:1; reverse, 4.76:1. The axle ratio is 4:1 on both models.

Drive is by shaft, that of the four-cylinder model being 1.25 inches in diameter, and that of the six 1.375. A Spicer universal joint is employed at each end of the shaft. The rear axle is of the full floating type, a Timken, having a nickel steel housing and employing the tapered roller bearings throughout. The design gives the cross section at any point greatest carrying capacity and resistance to driving and road stresses. The drive axles, differential and gears may be displaced readily without removing the wheels, the differential being readily accessible through an ample-sized inspection plate.

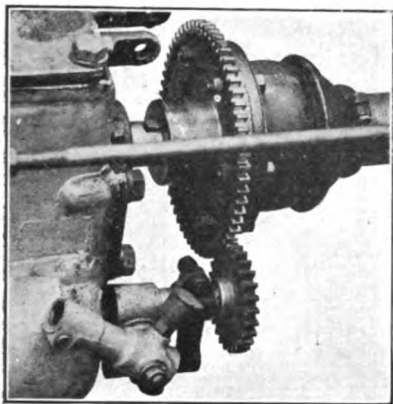
The front axle is a Timken of the I beam section type, and its dimensions provide a large factor of safety. It is of a high-grade steel, having two heat treatments, and chrome nickel steel heat treated spindles, arms and knuckles. The spindles are 1.5 inches in diameter. The same size axle is used on both chassis. Adjustable wheel stops are utilized to provide the proper steering angle and to prevent chafing of the tires by contact with the frame. The springs are semi-elliptic in front and three-quarter elliptic in the rear. The front members of the four-cylinder are 37.25 inches long and two wide, and those on the six are 41 inches long. The rear springs are 50.25 inches long on the four and 52.25 on the six.

Continuing its practise of the past, the Cole Motor Car Company fits large-sized brakes. The



**Rear View of the Cole Six Chassis, Showing Sturdy Rear Axle, Fuel Tank and Adjustable Tire Carriers.**





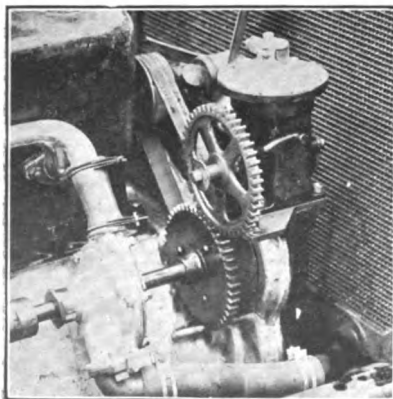
**Driveshaft Speedometer Connection.**

easily adjusted and lined with Autobestine, an asbestos fabric.

Among the changes noted is the placing of the driver at the left with centre control. The Gemmer steering gear of the worm and full gear type is continued, and an 18-inch corrugated wheel is utilized on both models. Provision is made for proper lubrication and adjustment. The frame is unusually strong.

A Mayo cellular radiator is used, as in former practise, and cooling is assisted by a three-bladed aluminum fan driven by a flat belt from a pulley on the pump shaft. Provision is made for regulating the tension of the drive. The centrifugal water pump is located midway of the motor on the right hand side. Large intake and exhaust water manifolds are still employed there, insuring the proper temperature of the fluid under all conditions of service. The wheelbase of the four-cylinder model is 120 inches, that of the six 137, with option of 56 or 60-inch tread.

Firestone quick detachable, quick demountable rims are standard equipment, and provision is made at the rear of the chassis for carrying two spare shoes. The tire sizes are as follows: Four-cylinder, 34 by 4.5 inches; six-cylinder, 36 by 4.5.

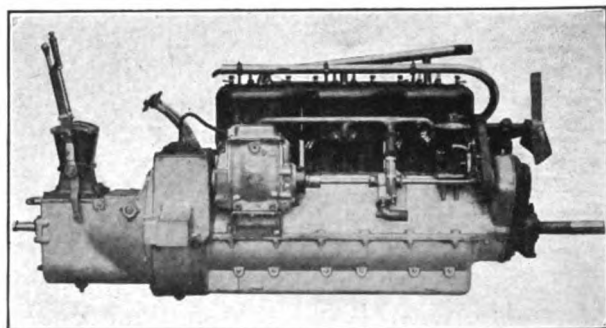


**Cole Power Tire Pump.**

two sets operate on the drums of the rear wheels, which are 1.55 inches in diameter and have a 2.5-inch face. The service member is actuated by pedal and the emergency by lever. Both sets are equalized,

with teeth on the periphery of the enclosed flywheel, the operation being effected by pressure on a small pedal located on the footboard. It is necessary before pressing the pedal to touch a button on the instrument board. All wires are carried in brass conduits, which is claimed to prevent possible short circuits, etc. The ignition equipment of the system is located on the left hand side of the power plant near the front and is driven by spiral gears from the camshaft. One of the features of the new Delco system is the utilization of a circuit breaker in place of fuses. The starting, lighting and ignition switch is a unit and is fitted with a Yale lock. Included in the system is an electric horn, which is operated by a button on the centre of the spark lever on the steering column.

An interesting unit in the equipment is the power tire pump shown in an accompanying illustration. It is mounted on a bracket on the right



**Unit Power Plant of New Cole Series, Having Centre Control, Power Tire Pump and Standardized Features.**

side of the motor and is driven by gears actuated by the fan belt. The gear driving the pump proper is controlled by a lever conveniently operated. It is a Taylor Nail pump, which was fully described and illustrated recently in these columns.

Another innovation is the method of driving the speedometer. The gearing is attached to the forward universal joint housing, where it is fully protected from dust, etc., a design making for a quiet drive and a more flexible connection than heretofore. The cowl board carries the ignition and lighting switches, oil sight feed, air gauge, air pump speedometer and clock and these control units are within easy reach of the driver. Both clutch and brake pedals are adjustable.

Roomy streamline bodies are fitted, the four-cylinder model being available with two, four and five-passenger types, while the six is provided in three types, seating two, six and seven passengers. The upholstery is deep and lux-



urious, long grain hand-buffed leather being utilized over deep, flexible springs and genuine curled hair. The front and rear doors on the four and five-passenger four-cylinder models are extremely wide, being 24 inches, while on the six and seven-passenger, six-cylinder types these are 24 inches in front and 26 in the rear. The auxiliary seats of these models are operated easily without disturbing the occupants of the tonneau, may be folded in compact form, and are so located that exit and entrance is not affected.

The running boards are exceptionally clean. The battery box is suspended under the front floorboard and is very accessible. The equipment is complete, including a cloth lined pantasote top fitted with Collins curtains, which fold into the top. A trouble lamp, also a light for the tonneau is included in the lighting equipment. A complete outfit of tools is carried in a drawer under the front seat. The windshield is of the rain vision type, securely mounted, and is practically a part of the body.

### THE LINCOLN HIGHWAY.

#### Vice President Fisher Hopes Portions May Be Completed by 1915.

Vice President Carl G. Fisher of the Lincoln Highway Association, when interviewed recently, emphasized the many benefits to be derived by a community through being located on the proposed Lincoln memorial transcontinental highway. He said that it was evident that the selection of the final route could only be governed by three or four factors. Those most vital were: The directness of the route from New York to San Francisco; the points of scenic beauty and historic interest which could be reached advantageously without too many or long detours, and the character and amount of support offered to the association by the local communities which would be direct beneficiaries of the highway.

Mr. Fisher noted that some sections of the Middle West had taken it for granted that the Midland trail had already been designated officially, as a portion of the route. He stated that in view of the fact that President Joy of the association went through Cheyenne to Salt Lake City on his recent trip across the continent, the Indianapolis tourists had determined to go to the Pacific Coast through Denver and over the Midland trail to Salt Lake City, in order that a detailed report of the conditions in this section might be secured.

He further expressed the thought that if quick action and hearty response followed the appeals of the association, inside of a year, the entire fund could be completed and that many stretches of the proposed highway could be built before the opening of the Panama-Pacific exposition in San Francisco in 1915.

### DETROIT ELECTRIC'S TRIP.

#### Washington to Baltimore and Return on One Charge of the Battery.

An interesting demonstration of the ability of an owner of a Detroit electric car, made by the Anderson Electric Car Company, Detroit, to make a moderate tour resulted from a trip between Washington and Baltimore and return, in which two Washington men recently took part. The distance between the two cities, over the



Detroit Electric on Recent Washington-Baltimore Trip.

route selected, is 41 miles, and therefore the entire distance covered was something like 82 miles. The car left Washington at 7:40 in the morning, and four hours later was in the down-town district of Baltimore. The return trip occupied an hour longer, detours being necessary on account of road repairs.

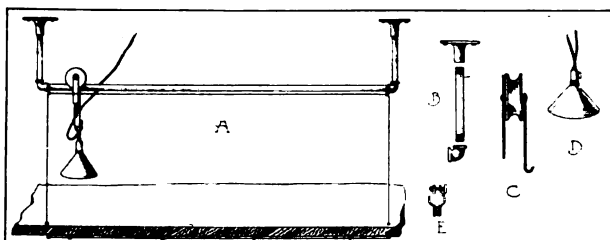
Part of the state highway had just been heavily oiled, and this materially checked the speed of the machine. At another point, heavy sand was encountered, but the electric experienced little difficulty in extricating itself. Upon the return to Washington, the entire trip having been made on one charge of the battery, the car was found to be in excellent condition, with sufficient current remaining to travel a number of miles further. This car already has been driven 6213 miles with the same equipment.



## THE REPAIR SHOP AND THE GARAGE.

### Suggestion for Constructing a Light Stand Operated from Either End of the Work Bench—Rack for Retaining Valves in Proper Order.

ONE of the chief requisites of the repair shop is a well-lighted work bench. The majority of installations provide a drop light, and



Working Plan of Adjustable Light for Work Bench: A, Showing How Light May Be Moved as Desired; B, Supporting Arm; C, Pulley; D, Lamp; E, Cable Carrier.

if the bench is very long, two or more of the lamps may be fitted. The disadvantage of a fixed light is that the workman is often obliged to move the work under the lamp, and when he wishes a tool at the other end of the bench must swing the light in the direction of the object sought.

In an accompanying illustration is shown a method of constructing a light rack over the bench, the sketch at A depicting the operation of the light, and it will readily be seen that it is possible for the workman to be at the extreme right of the bench and roll the lamp to him by means of the cable located under the bench, as shown in the drawing. Some benches would not be adaptable to its use.

The rack is easily constructed and the material required is not expensive. It consists of small gas piping, two standards and a like number of elbows. This material could be replaced by round iron, drilling and threading the parts to fit plates which are secured to the ceiling or to the wall, according to the location of the work bench.

A supporting arm is shown at B, while the pulley member is illustrated at C. The latter is provided with a hook for attaching the lamp cord and has an extension on the opposite side to retain the pulley on the rod. It is not necessary to fit the cable carrier shown at E, as the light could be moved by hand as desired. The cable was fitted in the installation noted by the writer, and the inventor of the plan states that it was extremely handy when he wished the use of the lamp at the other end of the bench. In addition

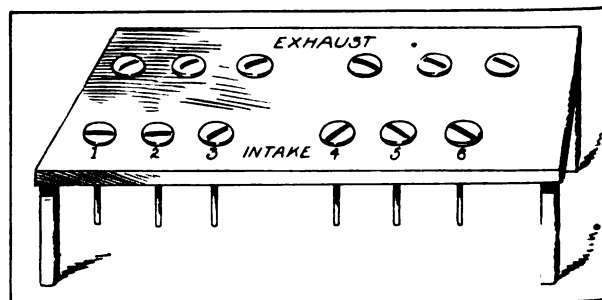
to making for convenience, the device makes for economy, as one light may be utilized in place of two or more.

#### VALVE RACK.

The complete, and sometimes the partial, overhaul of the power plant includes the removal of the valves, and when these members must be laid aside for any length of time, they are apt to become mixed if the work is intrusted to a green helper. The usual practise is to leave them in the cylinders, but this has its disadvantages in that care must be exercised in handling the units.

In an accompanying illustration is presented a suggestion for a valve rack which can be constructed of wood and may be made a permanent fixture on the work bench or a portable unit as desired. All that is required is to drill 12 holes to take the valve stems and the openings are marked from 1 to 6. For T head motors the upper row of holes could be utilized for the exhaust valves and the lower for the intakes. The rack also is adaptable for four-cylinder motors of the L head type, as well as other constructions.

Harry W. Wood, district representative of Enoch Morgan's Sons, with Cleveland, O., as headquarters, says that any travelling salesman who covers the grocery trade can increase his scope fourfold by using an automobile. Mr. Wood makes this statement as the result of his own experience in covering Ohio, Indiana, Michigan and Illinois in a Studebaker car, made by the Studebaker Corporation, Detroit.



Suggestion for a Valve Rack to Simplify the Work of Replacement in the Overhaul of the Motor.



## GARAGE AND REPAIR SHOP EQUIPMENT.

**T**HE ideal tire pump is the power driven member, but many small garages are not equipped with electricity, and the business does

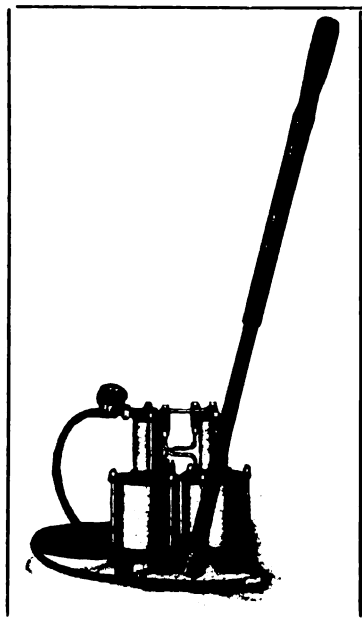


Fig. 1—Globe Tire Pump.

not warrant the installation of such systems. The Globe Manufacturing Company, Battle Creek, Mich, is producing what is termed the Globe Dead Easy tire pump, which is not only moderately priced, but is stated to inflate a 34 by four-inch tire to 75 pounds pressure in 90 seconds and with very little exertion.

The pump, which is shown at Fig. 1, is five by 8.5 by nine inches,

with the handle in two sections 16 inches long. It is designed for a permanent fixture or for carrying in the car, and when used in the garage may be clamped to a suitable portable base. The equipment includes 12 feet of hose, Globe self-retaining acorn nipple, which holds the tire valve open, and a registering pressure gauge. It is finished in nickel and black enamel.

A sectional view of the pump is shown at Fig. 2, and it will be noted that there are two pairs of cylinders, the smaller being placed above the larger, which are 3.5 in diameter. These are secured to a base. Each pair of cylinders has a two-stage piston and are connected by means of links to a pivoted rocker arm, to which is attached the operating lever or handle.

When the lever is moved to the right, as shown by the dotted lines, the right hand piston moves downward, the left hand member travelling in an opposite direction, forcing the air from the large cylinder through a connecting tube into the opposite small cylinder and producing the first stage of compression, which, it is stated, does not exceed 40 pounds to the square inch. On the reverse movement of the lever, the left hand piston moves downward, while the right travels upward, forcing the air out of the small cylinder

and producing the final stage of compression.

It is claimed that the link and rocker arm construction, and toggle action, results in each piston travelling rapidly at the beginning of its stroke, and when the load or resistance is very light. As the stroke advances and the load increases, it is stated that the travel is slower. It is pointed out by the maker that when the stroke is finished and when the load is the greatest, the three pivoting points, A, B, C, or A, D, E, are brought into a straight line, producing considerable leverage at the time it is most needed.

### LIGHTNING REPAIR KIT.

Fine threads utilized in motor cars make close and accurate fits imperative, else the efficiency of the part is greatly impaired. The Wiley & Russell Manufacturing Company, Greenfield, Mass., maker of screw-cutting tools, is marketing the Lightning auto repair kit shown at Fig. 3, which is designed for model T Ford, Maxwell, Metz and all medium-priced cars.

The screw-cutting assortment is very complete and was designed with special reference to the screw threads found on the machines above mentioned. It comprises 16 taps, 16 dies, two stock and two tap wrenches, permitting of the cutting of threads from 18 to 32 an inch, also pipe threads; in fact, the equipment is adapted to a large variety of work and different makes of cars, etc.

The assortment comes in a genuine goat skin leather case, having compartments to protect the

cutting edges of the tools, and the container is not only compact but very durable. The same high-grade material and workmanship for which the product of the Wiley & Russell Manufacturing Company is not-

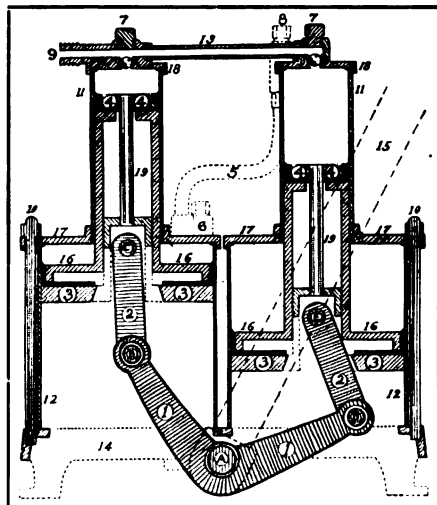


Fig. 2—Sectional View of Globe Tire Pump Showing Stages of Compression.



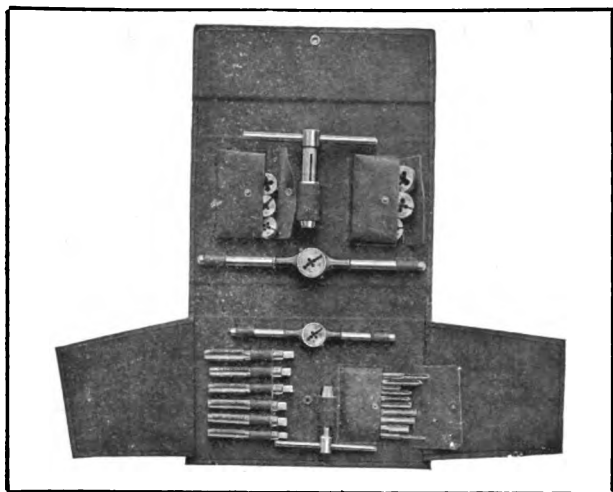


Fig. 3—Willey & Russell Lighting Auto Repair Kit Containing Complete Assortment of Screw Cutting Taps, Dies, Etc.

ed are incorporated. The company has a very interesting proposition for the trade.

### NEW BEARD AUTO JACK.

The Beard Auto Lift Company, Pleasant Lake, Ind., has brought out a new jack. The frame member is made by forming a piece of channel steel with the flange edges toward each other, and is held together near the top by a flat cross piece. Between the two upright pieces is a perforated standard, permitting of varying adjustments. This part is constructed of a piece of flat steel turned over at the top, making a standard of double thickness. On top is a swivel support. The hand or foot lever is also made double, and when it is clear down the upper part is in line with the fulcrum. All parts stand in a perpendicular position, and all load is carried on the two fulcrums on either side of the main support, which sets directly on the base of the jack. For repair work the jack is fitted with a pin adjustment.

### WINSOR VALVE REMOVER.

The Winsor Manufacturing Company, 55 Eddy street, Providence, R. I., is marketing a patented adjustable valve remover which presents interesting as well as practical features, in that it is adapted to any type of engine. As will be noted by the accompanying illustration at Fig. 4, it is comprised of a barrel A, levers B and C, and a chain. The barrel member carries a threaded spindle which may be raised or lowered as desired. This is inserted through the spark plug opening and adjusted to hold the valve firmly on

its seat. It should be explained that the barrel member rotates freely on the spindle, permitting of operation on motors of varying construction. The method of compressing the valve spring is shown in the illustration, the end of the chain being attached to the lever B and the other end to the lever C. Both of these parts provide means for varying the location of the chain. To displace exhaust valves, the intake cap is utilized. The remover is made to fit all spark plug openings and extra barrels are not expensive. It comes nickel plated and with an enamel black finish. As will be noted, the length of the lever C provides for considerable leverage.

### OIL PACKING PISTON RING.

The Automobile & Accessories Manufacturing Company, Baltimore, Md., is marketing a new type of piston ring, which is claimed to reduce friction, insure perfect lubrication and to fit itself to the cylinder walls. It has three V shaped grooves cut around its face, making the bearing just one-half of the ordinary .25-inch ring. It is claimed that because of the ribs the ring will wear to a fit very quickly, and that after seating the wear will be very gradual. The grooves act as a lubricant retainer, insuring lubrication as well as preventing loss of compression. It is also stated that the construction reduces friction.

On two small order blanks, Purchasing Agent C. J. Reynolds of the Studebaker Corporation, Detroit, recently let the contract for 16,000,000 pieces of material for use in building the first run of Studebaker cars in the fiscal year that opens Sept. 1. The order represented cotter pins and nuts sufficient to last until about Jan. 1.

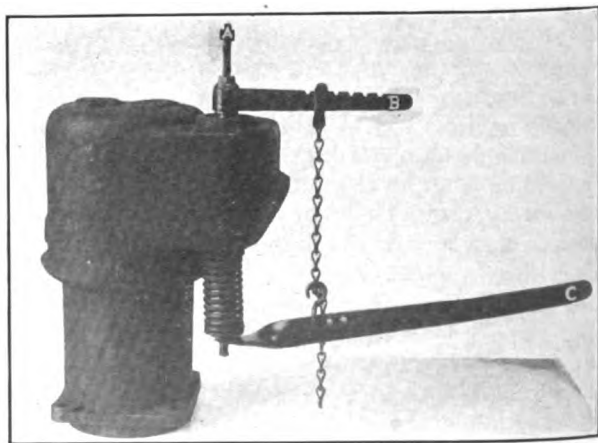


Fig. 4—Winsor Adjustable Valve Remover Adaptable to Any Type of Motor.



## FROM INDIANA TO THE PACIFIC COAST.

**T**HE following brief story of the recent Indiana-Pacific tour of the Indiana Automobile Manufacturers' Association, written by Elwood Haynes, president of the Haynes Automobile Company, will prove of interest, as indicating the character of roads over which the tourists made their memorable trip from Indianapolis to San Francisco and Los Angeles:

The tour had two objects in view. First and foremost, we wished to interest the public in the scheme for building a highway across the continent. This scheme originated in the mind of Carl Fisher of Indianapolis, and who immediately set to work to put it into execution by inviting the Indiana manufacturers to join together in a tour to the Pacific Coast.

The roads of Illinois were in much better condition than expected; while not all that could be desired were particularly good just at the time we traversed them. We were cordially greeted in St. Louis, which was our first stopping point in the state of Missouri. The roads of that state were fairly good and the people had taken the pains to improve them in many places for our particular benefit. The weather conditions in Kansas were most excellent, and it is reported that 300 miles of highway were made ready for our especial benefit. Certain it is that we made good time throughout the length of this great state.

From Denver onward our journey became more interesting because we were entering the vast Rocky Mountain system, which is not only new to Hoosiers but inspiring to all tourists. Those of us who had been through these mountains before by rail soon realized that going through them in an automobile was an entirely different matter. As the road wound in about these majestic peaks and one after another of the snow crowned summits came into view, we were impressed with the fact that the automobile affords the best means of really viewing these natural wonders that has ever yet been produced. It was with some trepidation that we rolled along on the narrow shelves called roads, from which we could look up at the rocky wall above us and downward thousands of feet into a chasm below. We realized that coolness and precision in the driving of the cars were the sole guarantees of our safety.

Roads of this character were so numerous, however, that we soon became accustomed to the sensation and began to enjoy the beauties which were constantly unfolding to view. Far away we could see some giant peak, its distant snow capped summit glittering in the sunlight, while all around us were mountains of lesser height varying in appearance from solid rock to green clad verdure. It was at the summit of the Rockies at the height of about 11,000 feet that we found a snow bank, near which beautiful scarlet flowers were growing, so that we were able to gather a bunch of flowers near a snow bank. Not far from this point we were able to look down over a nearly sheer precipice upon the terminus of the Moffit road nearly 800 feet beneath.

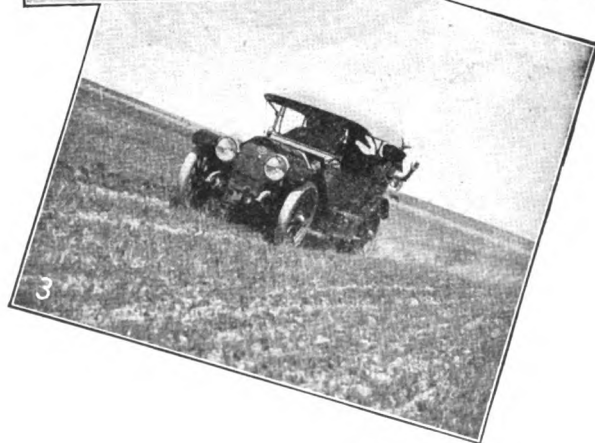
Soon after leaving the Rockies we entered the Sierras, which, while perhaps not so grand as the Rockies, presented scenes of beauty peculiar to themselves and quite different from anything we had seen before. Between the Rockies and the Sierras were vast stretches of desert land in the states of Utah and Nevada. Through some of this desert the roads were exceedingly bad, while on others they were as smooth as boulevards and we could readily make speeds of from 30 to 35 miles an hour without the slightest shock or jar.

We finally arrived at Carson City, Nev., which is located near the celebrated blue Lake Tahoe. This beautiful lake deserves much more than a passing notice, since there is said to be nothing like it in all the world. The water while not pure has the appearance of liquid sapphire, so intense and brilliant is its color. We were welcomed and given free entertainment at the tavern of Tahoe, located on its shore.

The performance of Indiana machines was highly

creditable, and I feel compelled to say in all sincerity that Indiana has established a great prestige in the minds of the people along this road regarding the character of her products.

I was personally very much pleased with the performance of the Haynes cars. A careful examination failed to show any defects in either the four or six-cylinder machine. Almost no time was spent on cars en route, and the appearance at the completion of the journey, which ended at Los Angeles, was more like that of new cars than of machines that had crossed the continent.



With the Haynes Team in Colorado: 1, The "Lucky Thirteen", Between Colorado Springs and Denver; 2, the Two Cars at Junction City; 3, No. 12, Near Denver.



## IN THE REALM OF THE MOTORCYCLIST.

### Limits of New F. A. M. Districts Defined--Pirate Single and the Master Machine Latest Additions to the List--News of the Industry in General.

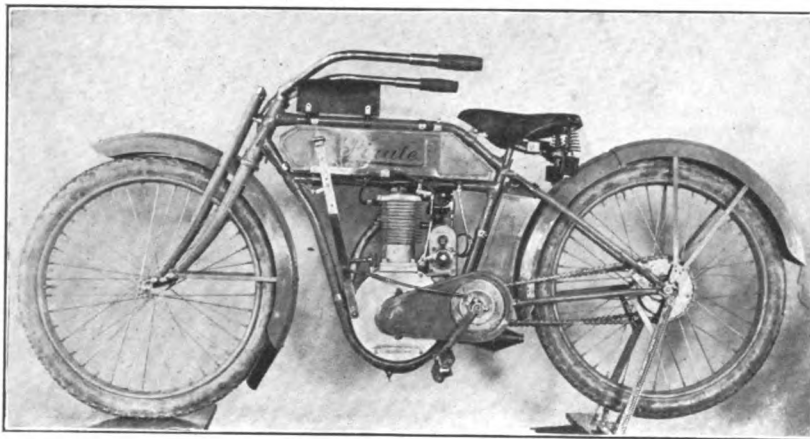
THE 1913 assembly of the Federation of American Motorcyclists, at Denver, Col., decided to return to the district form of government and the United States was divided into eight districts, which have been defined as follows: New England, Maine, New Hampshire, Vermont, Massachusetts, Rhode Island and Connecticut; Atlantic, New York, New Jersey, Pennsylvania and Delaware; South, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Tennessee, Kentucky, Mississippi, Cuba, Porto Rico and Panama; Lake, Ohio, Indiana, Illinois, Michigan and Wisconsin; North Central, Minnesota, North Dakota, South Dakota, Nebraska, Iowa and Missouri; South Central, Colorado,

cycle engine. Full information concerning the Federation of American Motorcyclists is included, as well as all the recognized world's records, and a particularly valuable feature is the list of machines and the grade of Mobiloil best adapted for their use on each. As already stated, the booklet is free to those who make request.

#### The New Pirate Single.

The Milwaukee Motorcycle Company, Milwaukee, Wis., which was organized about the time of the Chicago motorcycle show last winter, is announcing a new 5-6 horsepower single-cylinder machine, which is to be known as the Pirate. The mount is shown in an accompanying illustration, and it is understood that it is to be followed in the near future by a twin, containing many of the same features.

The motor is said to possess a new system of valves that give it increased power. The bore is 3.3125 inches and the stroke four, the unit being termed by the maker a long stroke type. The frame is held to be of modern design, incorporating a fuel tank of three gallons capacity and a one-gallon oil tank. A free engine multiple disc clutch and multiple disc rear hub are among the other features noted. Control is by Bowden wire, concealed in the handlebars. The floating seat-



The New Pirate Single, Made by Milwaukee Motorcycle Company.

Kansas, New Mexico, Oklahoma, Arkansas, Louisiana and Texas; North Pacific, Montana, Wyoming, Idaho, Washington, Oregon and Alaska; South Pacific, Utah, Arizona, Nevada, California, Guam and Philippine Islands.

#### Gargoyle Mobiloil Booklet.

The Vacuum Oil Company, Rochester, N. Y., is distributing among riders who make application therefor an interesting booklet containing information about motorcycles and their lubrication. It is maintained that Gargoyle Mobiloils, which have been made by this company ever since motorcycles were first used, are recognized as a standard brand for their correct lubrication.

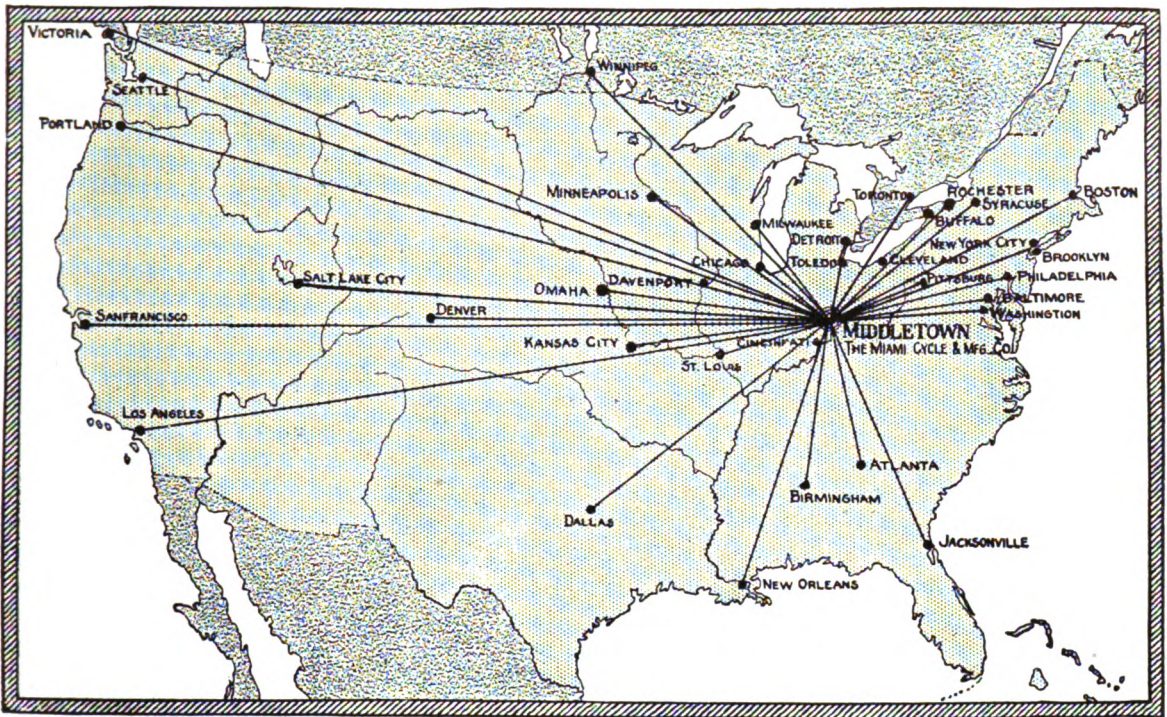
The booklet contains a description of these oils and explains their application to the motor-

post, a special patented design, is expected to make riding the Pirate a real pleasure.

#### Enter the Master Machine.

A company has been formed at Harrisburg, Penn., for the purpose of manufacturing a motorcycle to be known as the Master Machine, the invention of Charles W. Gerhart of Mt. Holly Springs, Penn. The officers of the company are: President, C. W. Gerhart; vice president, Dr. George M. Diffenderfer, Carlisle, Penn.; secretary and treasurer, J. F. Rohrer. Work will be begun at once on a new factory to be located adjacent to the tracks of the Reading railroad at Paxtang, a suburb of Harrisburg. The inventor of the new machine claims many features for his motorcycle not found in other makes.





**THE CENTER OF MOTORCYCLE ACTIVITY  
IN THE UNITED STATES  
is Middletown, Ohio, the home of**

**THE FLYING MERKEL**

The keynote of our 1914 selling campaign will be SERVICE—Service for the dealer, and Service for the rider. With distributing points in all of the principal cities, and dealers in practically every county in the entire United States, Flying Merkel riders can be assured of prompt and satisfactory service at all times.

With our new factory at Indianapolis, and with another \$25,000 addition being built to our plant in Middletown, Ohio, we will be in position to give dealers throughout the country prompt and satisfactory handling of their orders at all times.

After a most careful analysis we predict that the season of 1914 will in every way prove the greatest motorcycle season in the history of the industry, and it therefore is important for dealers to place their specifications early, and for riders to order early from their dealers. We are ready to sign for 1914 now.

Next season as was the case this year, the popular slogan will be, "If it passes you, it's a Flying Merkel."

**THE MIAMI CYCLE & MFG. CO.**  
**320 Hanover Street, Middletown, Ohio**

When Writing to Advertisers, Please Mention The Automobile Journal.



**Recent F. A. M. News.**

The secretary of the Federation of American Motorcyclists reports that the following new clubs have affiliated: Ottumwa, Ottumwa, Ia., 12 members; secretary, H. M. Fagan. Muscatine, Muscatine Ia. 17 members; secretary H. M. Mavis. Tri-City, Davenport, Ia., 42 members; secretary, W. C. Willumsen. Atlantic, Wilmington, N. C., 16 members; secretary, E. C. Krahnke. Salt Lake, Salt Lake City, Utah, 29 members; secretary, Dr. A. L. Gindrup. Warsaw, Warsaw, Ind., 26 members; secretary, Eugene Felkner.

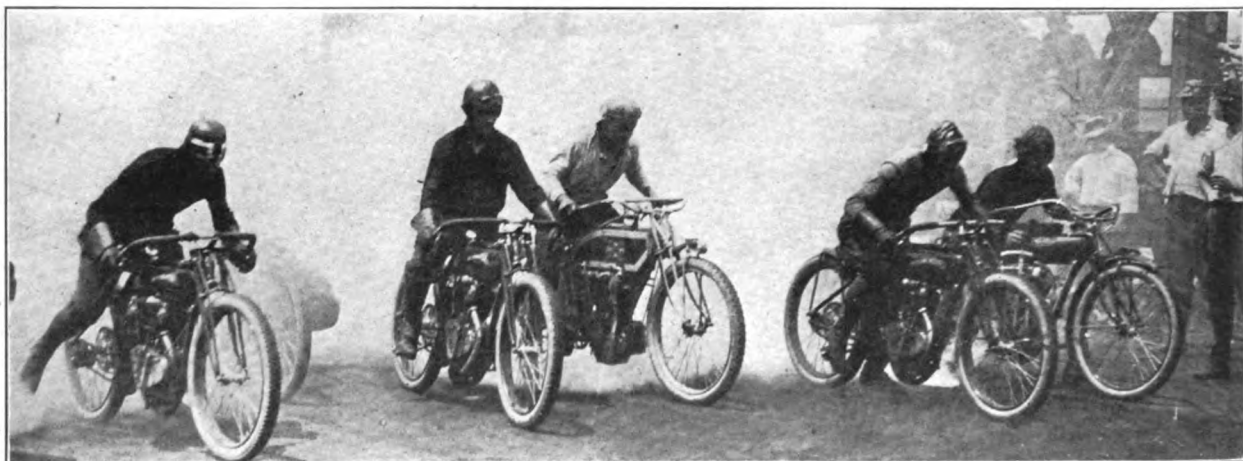
New registered repair shops reported by the F. A. M. are: W. C. Frisk, 832 Olive street, Eugene, Ore.; Eugene Motor Supply Company, 836 Olive street, Eugene, Ore.; R. W. Clawson, Galt, Ia.; Mickel Motor Garage, Comstock, Neb.; W. W. Waugh, Eskridge, Kan.; Barney H. Plevo, 1707 Main street, Laporte street, Wilmington,

Georgia, four; Virginia, four; West Virginia, three; New Hampshire, two; Tennessee, two; Minnesota, two; North Dakota, two; Iowa, two; Washington, two; Missouri, one; North Carolina, one; Rhode Island, one; Vermont, one.

**Manufacturers at Atlantic City.**

The annual meeting of the Motorcycle Manufacturers' Association at Atlantic City, N. J., was a success, both from a business and social viewpoint. There was a large attendance of delegates and the business of the session was transacted with harmonious promptness. Following are the officers elected for the coming year: President, T. W. Henderson, Henderson motorcycle, Detroit; vice president, W. G. Schack, Emblem, Angola, N. Y.; treasurer, Arthur Davidson, Harley-Davidson, Milwaukee, Wis.; secretary, L. D. Harden, Pope, Hartford, Conn.

A. B. Coffman, retiring president, received the



**The Flying Merkel Racing Team, Bowser, Snyder and Taylor; Also Warner on an Indian Mount and Goudy on an Excelsior Machine.**

N. C.; Bond Bros., 212 Walnut street, Muscatine, Ia.

Louis J. Tetley, 4 Mechanic street, Red Bank, N. J., and J. F. Tucker, Pennville, Ind., have been appointed county commissioners by the state commissioners of their respective states. The former is for Monmouth county and the latter for Jay county.

The membership of the F. A. M. was increased during the month of July by 519, divided according to states as follows: New York, 65; Ohio, 56; Indiana, 49; Massachusetts, 48; Illinois, 43; Kansas, 36; Oregon, 35; Colorado, 21; Connecticut, 20; Nebraska, 14; Texas, 14; California, 13; Pennsylvania, 12; New Jersey, 11; Montana, nine; South Dakota, eight; Michigan, seven; Oklahoma, seven; Wisconsin, seven; Maryland, six; District of Columbia, six; South Carolina, four;

thanks of the association for his valuable services and was rewarded by being elected unanimously to the position of general manager of the association, with complete direction of the motorcycle shows. His compensation will be the surplus from the exhibitions. He reported that the applications for space at the Chicago display already exceed the entire exhibit of last season, and he was directed to take up negotiations with Samuel Miles, manager of the New York City automobile show, for motorcycle space in the Grand Central Palace where the top floor will be reserved for this display.

**Emblem's 2319-Mile Trip.**

Mr. and Mrs. M. E. Gale, Angola, N. Y., made the round trip to the Denver convention of the Federation of American Motorcyclists on their twin Emblem motorcycle, made by the Emblem



Manufacturing Company, Angola, and fitted with a special side seat attachment. The entire trip occupied 13 days, the total riding time being 87 hours, with an aggregate mileage of 2319, or an average of 178 miles a day at an average speed of 27.5 miles an hour.

### Fighting Great White Plague.

As a result of an experiment made by the Wisconsin Anti-Tuberculosis Association, with headquarters in the Goldsmith building, Milwaukee, Wis., last summer, several Harley-Davidson motorcycles, made by the Harley-Davidson Motor Company of that city, are being used to good advantage in the crusade now being conducted in that state. An accompanying illustration shows a lecturer and his assistants in camp, these men being engaged in a rural campaign.

The work consists of placarding the country with health signs and giving talks at creameries, country cross roads and small villages, wherever a crowd can be assembled. A village usually is chosen for an illustrated lecture in the evening, and in working the surrounding country during the day, the health evangelists advertise the lecture. Stereopticon views are a feature of the talks, which are many times given out of doors. The stereopticon is operated from the luggage carrier of the motorcycle, being connected with the gas tank, which also supplies the headlight. The expense of this work is comparatively small, since each machine carries two men and all hotel bills are eliminated.

### Hamilton Resigns from Directorate.

President B. J. Patterson of the Federation of American Motorcyclists has received the resigna-

tion of G. H. Hamilton as a member of the board of directors. Mr. Hamilton states that he is not retiring from the organization, but will continue to take an interest in its affairs.

### Club Notes, Here and There.

P. E. Zimmerman, secretary of the Short Grass Motorcycle Club announces that the club is planning to attend the Chicago motorcycle show in a body. The plan contemplates meeting at Topeka or Kansas City and proceeding thence to the exhibition. The Short Grass Club contains many dealers in its membership.

The Milwaukee Motorcycle Club has secured a clubhouse at 26th and Wells streets, and owing to its size the membership of the organization has been limited to 150. Card rooms, pool and billiard rooms have been equipped



Special Agents of the Wisconsin Anti-Tuberculosis Association and Their Harley-Davidson Mounts in Camp.

and a steward has been engaged, so that when the club is in full running order meals will be served to club members.

The Atlantic City Motorcycle Club is preparing for its annual endurance run, to be held about Sept. 14. The route will extend to a point about 100 miles from the city and return.

The Beloit Motorcycle Club, with 50 members, has been formed at Beloit, Wis., with the following officers: President, R. S. Maxwell; vice president, Guy Carleton; recording secretary, Ray Talbot; financial secretary, Harvey Good; treasurer, Arthur Shevlin; captain, Claude Smith; first lieutenant, Carl Sparks; second lieutenant, Alva Grant.

The Nomad Motorcycle Club, Harrisburg, Penn., has elected the following officers: President, C. G. Sellers; vice president, Claude Baskin; secretary, J. N. Keller; treasurer, H. G. Heagy; executive committee, C. Baskin, Charles Uhler, John Stonnfez, L. King, H. C. Heagy, Harry Seacrist, William M. Patty; road committee, captain, Jean Schaub, B. Hepperly, M. Smiley.

### JOIN THE F. A. M.

which is the National Organization fostering the interests of motorcyclists along legislative and other lines. Cut this out, mail it, and you will get the reasons.

#### E. M. ESTABROOK

Chairman Membership Committee Federation  
American Motorcyclists,  
BANGOR, MAINE.

Please send me the F. A. M. Booklet and all information interesting to prospective members.

Name .....

Address .....

### 1913 F. N. SHAFT-DRIVE MOTORCYCLES.

|   |       |
|---|-------|
| Lightweight Single, with Two-Speed Gear               | \$275 |
| Only Machine Built With Handle Bar Control of Clutch. |       |
| Four-Cylinder   | \$300 |
| With Handle Bar Control of Clutch                     | \$350 |
| Two-Speed Gear, Extra                                 | \$50  |

Equipment includes two brakes, footrests if desired, compound spring fork, combined luggage carrier and stand.

**American F. N. Company, Boston, Mass.**

Branch—415 Trumbull St., Hartford, Ct.



# NEWS OF THE MANUFACTURER AND DEALER.

The following concerns have been incorporated recently to manufacture or deal in automobiles, accessories, supplies, etc.

**Anti-Rust Company**, Akron, O.; \$20,000; automobile accessories; C. T. Grant, Frank Rice, Lena Dewey, Bessie Rice, Alexander Sicherman.

**Mecca Automobile Society**, Wilmington, Del.; \$50,000; C. M. Miller, W. F. Vashell, L. T. Layton.

**Axwell Equipment Company**, Pittsburg, Penn.; \$5000; F. Patterson, W. J. Mulvihill, J. R. D. Huston.

**Walser Corporation**, New York City; \$10,000; Charles Pechner, Samuel Sperling, Solomon Strauss.

**Tyre Service, Inc.**, New York City; \$10,000; J. C. Travis, C. L. Clune, M. M. Hovey.

**Barnesboro Auto & Machine Company**, Barnesboro, Penn.; \$25,000; J. L. Berkebile, N. K. Harris, J. R. Musser, W. S. Wheeling, J. M. Crennan.

**Lanpher Rubber Tire Machine Company**, Carthage, Mo.; \$20,000; W. E. Brinkerhorf, Joseph Herrin, Earl Lanpher, John Dermott.

**Chicago Tire Goods Company**, Chicago; \$10,000; Louis Dulsky, Samuel Dulsky, J. E. C. Blake.

**Mount Vernon Auto Station**, Mount Vernon, N. Y.; \$3000; William Bunn, LeRoy A. Preston, Lucy Preston.

**Auto Supplies Export Company**, New York City; \$5000; F. W. Keegan, L. M. Fay, Antranik Aprahamian.

**Wilcox & Herr**, Indianapolis, Ind.; \$300; taxicab and transfer business; H. S. Wilcox, D. H. Herr, B. W. Rout.

**Motor Transportation Company**, Cincinnati, O.; \$250,000; George Schorr, E. H. Hoelscher, W. G. Hoelscher, H. A. Hoelscher, W. S. Vossler.

**Army Tire Company of New York City**, New York City; \$1,000,000; G. W. Griffin, F. H. Kessell, L. J. Roll, M. M. Algere, Jr.

**Howe Engine Company**, Indianapolis, Ind.; \$50,000; to manufacture motor fire apparatus; B. J. C. Howe, L. M. Howe, H. R. Howe, P. G. Howe, W. M. Hopkins.

**Chawck-Smith Automobile Company**, Louisville, Ky.; \$4500; J. T. Chawck, William J. Chawck, H. R. Smith.

**Monarch Auto Company**, Louisville, Ky.; \$10,000; C. H. Pierson, J. Gosnell, G. W. Aydelott, W. L. Kennett, T. G. Summers, A. T. Wingate, C. A. Colley, J. L. Morris, E. Coffman.

**United Traction Improvement Company**, Philadelphia, Penn.; \$100,000; W. J. Spangler, V. H. Conkle, H. S. Trego.

**Gramont Traction Plow Company**, Springfield, O.; \$600,000; A. W. Grant, P. A. Montanus, Oscar Kaser, Walter McKinney.

**Wright Auto Company**, St. Louis, Mo.; \$4000; C. A. Wright, W. B. Wood, A. A. Hopkins.

## GARAGE AND DEALER.

**R. D. Anderson**, Warren, O., dealer in American underslung cars, made by the American Motor Car Company, Indianapolis, Ind., adopted a unique method of advertising in the construction of the new garage and salesroom opened recently. Mr. Anderson so designed his new building that the front is almost an exact reproduction of the front elevation of the American machine, being built to resemble the radiator. The design has been carried out in detail, showing even the eagle which surmounts the radiator filler cap on the car, as will be noted by the accompanying illustration.

**The Hall Rubber Company**, 1402 Ridge avenue, Philadelphia, has taken the agency for Motz tires, made by the Motz Tire & Rubber Company, Akron, O., and will handle this product in eastern Pennsylvania, Maryland and Delaware. L. S. Hall, head of the company, is a veteran in the tire trade, which he knows from every angle.

**The Studebaker Corporation of America**, San Francisco branch, has changed location and is now at the corner of Van Ness avenue and Hemlock street, in much larger quarters.

**The Spiker Supply Company**, Scio, Hamilton county, O., has added an automobile supply department to its business.

**Horst & Streiter**, Rock Island, Ill., has rented the Rogers granary building at Byron, Ill., which will be remodelled preparatory to establishing a garage.

**The Piqua Auto Supply Company**, 133 North Main street, Piqua, O., has opened for business with a complete stock of supplies, accessories and machine shop equipment.

**The Torrington Welding Company**, Torrington, Conn., has been formed to conduct a garage and automatic gas cutting and welding business.

**Z. T. Eagleston** and **A. B. Shanks** have formed the Smithville Auto & Machine Company at Smithville, Tex., and a building on Second street has been rented.

**Glenn E. Brubaker** proposes to open a garage at Litchfield, Ill. A building is being remodelled for his use.

**Kowalke & Doty** is a new concern organized at Benton Harbor, Mich., to do automobile repair work. Its quarters are at 350 Territorial street.

**The Central Garage** is a new establishment opened by Thomson & King at 227 North Centre street, Phoenix, Ariz.

**The Lawrenceville Auto Company** has taken over the business of the Robinson Donaldson Buggy Company of Vincennes, Ind. The company will handle Studebaker, Lozier and Chalmers cars.

**The Cartercar Nebraska Company**, Omaha, Neb., of which W. E. Foshier is president, has secured a location on West Broadway and is to establish an agency at Council Bluffs, Ia.

**H. D. Graves**, who recently took over the Imperial Garage at Hartford, Conn., to handle the Henderson and Lozier cars, has combined his interests with the Capital City Auto Company, at Allyn and High streets, distributor of Mitchell pleasure cars and Stewart trucks. All these cars will now be marketed under the style of the



R. D. Anderson's American Car Agency in Warren, O.—Note Shape of Building Front.

**Claremont Garage**, Chicago; \$2500; J. F. Hutchinson, Jacob Diamond, A. S. Winslow.

**Packard Transportation & Repairing Company**, New York City; \$3000; John Santora, Anna T. Vacarelli, F. P. A. Vacarelli.

**Jenny Gasoline Extracting Company**, Chicago; \$25,000; J. N. Lucas, T. R. Barron, B. M. Osburn.

**Peerless Non-Puncture Company**, New York City; \$600; Maurice Uran, Harry Citret, Frank Eber.

**Turbine Muffler Company**, Chicago; \$2400; Joseph Libal, G. W. Gardner, J. J. Karchelser.

**Electric Auto Sales & Rental Company**, Chicago; \$12,000; Nathaniel Rubinkam, H. F. Tucker, G. C. McLaren.

**Michigan Motor Car Company**, Chicago; \$25,000; W. J. Pierce, E. D. Shuntluff, M. E. Shuntluff.

**National Association of Automobile Engineers**, Chicago; \$2500; commission and brokerage business and automobile, motor boats and accessories pertaining thereto; Leon P. Hutchins, A. L. Pettet, William Roles.

**T. S. Wheel & Manufacturing Company**, Chicago; \$2000; Fred Schulz, T. J. Smulski, Stanley Zukowski.

**Woods Mobillette Sales Company**, Chicago; \$15,000; F. A. Woods, E. F. Blettner, J. C. Long.

**Cincinnati Automobile Clearing House**, Cincinnati, O.; \$5000; Robert Uriche, C. F. Hornberger, A. R. Spangenburg, C. R. Chadwick, S. D. Bromley.

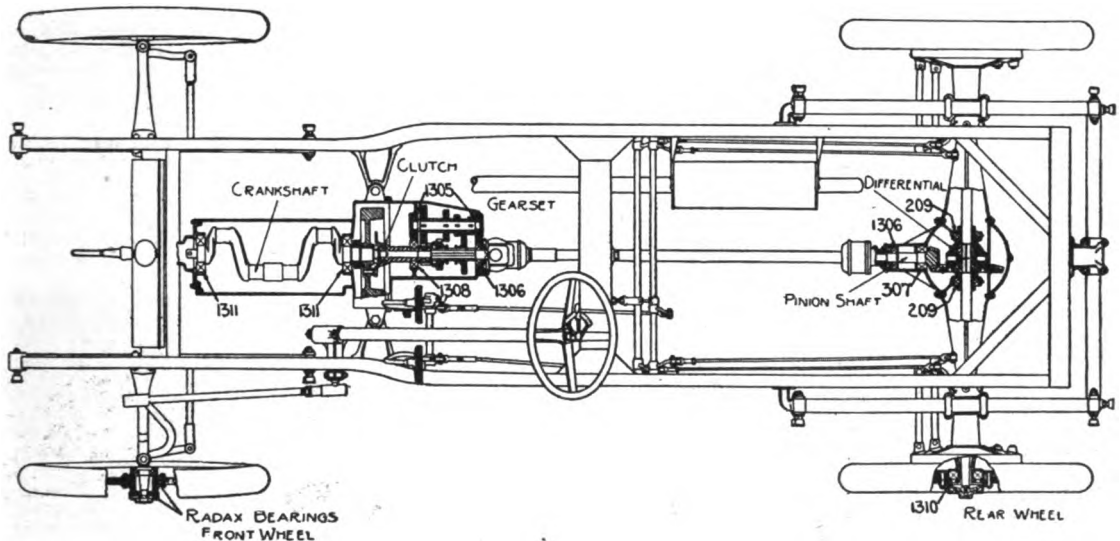
**Warner Detroit Motor Works**, Detroit; \$100,000; H. L. Warner, W. A. Gleesen.



*American Made for American Trade*

# NEW DEPARTURE

## Ball Bearings Throughout and Why



**B**Y the use of New Departure ball bearings throughout the entire Chassis, the manufacturer of this car has reduced power losses, repairing and operating costs to a minimum.

New Departure ball bearings eliminate friction. Friction is expensive, wears away the parts, hastens depreciation, and makes frequent repair necessary.

By eliminating friction New Departure ball bearings waste so little of the motor energy that maximum driving power is transmitted to the rear wheels. By eliminating friction there is practically no wearing away of the parts. The life of the entire car is longer and repairs are fewer.

All of these advantages are secured without sacrificing bearing efficiency. New Departure ball bearings will carry the load under all conditions of service equally as well as any bearing made.

Have you seen our interesting brochure on "Friction Elimination"? If not, drop us a card today and it will be forwarded to you by return mail.

## **NEW DEPARTURE MFG. CO., Bristol, Conn.**

**Western Branch, 1016-17 Ford Bldg., Detroit, Mich.**

When Writing to Advertisers, Please Mention The Automobile Journal.



Capital City Auto Company, of which Mr. Graves has been elected secretary, the other officers being: President, Bernard F. Smith; treasurer, W. F. Dahill.

**The Auto Tire Repair Company**, Oyster Bay, N. Y., has reopened for business following a recent fire. It is now in the Sagamore garage building on West Main street.

**Sharp & Robbins** has opened a garage on South Broad street, Trenton, N. J. The firm also operates a repair shop on South Clinton avenue.

#### WITH THE MANUFACTURERS.

**The Heinze Electric Company**, Lowell, Mass., is planning for the organization of a \$75,000 concern under the name of the Heinze Electric Company, Ltd., of Canada. The concern at Lowell manufactures electric apparatus, including Heinze magnetos and plugs. The new company is being created for the purpose of furnishing coils to the Canadian Ford factory, and will be established at Walkerville, Ont.

**The Bosch Magneto Company**, New York City, maker of Bosch magnetos, is increasing its supply stations throughout the country, and the following are the latest additions to the list: Pennsylvania Rubber & Supply Company, Cleveland, O.; Ozburn Automobile Supply Company, Inc., Memphis, Tenn.; Lemke Electric Company, Milwaukee, Wis.; W. D. Andrews Company, Syracuse, N. Y.; Diamond Motor Car Company, New Rochelle, N. Y.; George B. Wuestefeld Company, New Haven, Conn.; Newport Engineering Works, Newport, R. I.; Sloan & Clapper, Newburg, N. Y.; Hamilton & Bertram Motor Supply Company, San Diego, Cal.; J. G. McCrillis & Son, Manchester, N. H.; Automobile Supply Company, Tacoma, Wash.; G.

has broken ground for an addition to its present factory. The structure will be of uniform construction, with the main building, and will be used for the manufacture of gray iron castings.

**The Pharis Tire & Rubber Company**, Columbus, O., has a large force of men at work on the two buildings being erected as additions to its plant.

**The Evansville Commercial Truck Company**, Evansville, Ind., is negotiating for the plant recently vacated by the Reliance Truck Company at Owosso, Mich. The industrial committee of the Owosso Improvement Association has the matter in charge.

**John N. Willys**, president of the Willys-Overland Company, Toledo, O., maker of Overland cars, has purchased the assets of the Castle Lamp Company, Battle Creek, Mich. The machinery and stock of materials will be transferred to Toledo, where the manufacture of lamps will be carried on to supply Overland machines.

**The Hayes Wheel Company**, Jackson, Mich., has taken over the manufacture in this country of the shock-absorbing hub which was introduced by John Muir, the inventor, to the American trade, according to an announcement made following Mr. Muir's return to London, England. The hub is said to contain a large number of balls which distribute the road shocks before they are transmitted to the axle spindle.

**The Sternberg Manufacturing Company**, Milwaukee, Wis., maker of Sternberg trucks, has broken ground for an addition to the large plant erected three years ago. The new plant will cost \$50,000 and was made necessary because of the cramped condition of the present factory. With recently booked orders for commercial vehicles for American and South American use, an enlargement of



Thirty-Five Owners of King Cars, Recent Guests of King Motor Car Company, on Outing at Lake Orion, Mich.

W. Shroyer & Co., Dayton, O.; J. Edward Newton, Fall River, Mass.; Southern Auto & Supply Company, Chattanooga, Tenn.; G. Norman Baughman Company, Inc., Tampa, Fla.; McGraw Bros. Company, Jacksonville, Fla.; Fox-Shryock Auto Company, Fort Wayne, Ind.

**The King Motor Car Company**, Detroit, maker of King cars, was the recent host of 35 Detroit owners of King cars at Lake Orion, which has been taken by this company for two years, and at which it has been the host for a number of pleasant gatherings this year, including one composed of the men who sell the company parts and accessories. In this party were over 50 men, who enjoyed a two days' week-end outing. At each of these affairs the King company provides ample entertainment, and fishing and bathing form a large part of the amusements on each occasion. An accompanying illustration shows the owners who were present at the recent gathering.

**John D. von der Leith**, for five years connected with the Splittdorf Electrical Company, Newark, N. J., maker of Splittdorf magnetos, has severed his connection with that organization to enter business on his own account. He has formed the Reliable Auto Specialty Company, with headquarters at 306 Mott avenue, New York City, to handle automobile accessories in general, but magnetos, coils, spark plugs, cable and other ignition devices in particular. Mr. von der Leith is an electrical expert of high ability, and he starts on his new enterprise in the somewhat novel method of touring the country in a fully equipped car, demonstrating his goods in service.

**The Pontiac Motor Castings Company**, Pontiac, Mich.,

facilities was imperative. When the addition is finished the company will exactly double its working force and output of trucks.

**The J. I. Case Threshing Machine Company**, Racine, Wis., maker of Case cars, has equipped its new South works at Lakeside, Racine, with machinery. The plant consists of a foundry and machine shop. A power plant is being built and the drive will be electric throughout. Much of the company's motor car work will be done in the new factory.

**The Duplex Power Car Company**, Charlotte, Mich., at its annual meeting elected the following directors: Frank P. Town, M. J. Lamson, Maurice Bolstrom, George A. Williams, Frank L. King, Horton H. Bryan and Truman Gillette. Mr. Town and Mr. Lamson were elected president and secretary, respectively.

**E. J. Kaufman**, Canton, O., is to erect a factory for the manufacture of automobile parts.

**The Allen Motor Car Company**, Fostoria, O., will build additions to its present plant on North street, instead of adding to the Peabody Body Company's plant, as was formerly intended. The addition is to care for the increase in 1914 business.

**The Chandler Motor Car Company**, Cleveland, O., maker of Chandler cars, has moved into its new factory.

**The National Tube Company**, Pittsburg, Penn., announces that it has entered the electrical conduit field. It has contracted with the National Metal Molding Company and the Safety-Armorite Conduit Company, both of Pittsburg, to manufacture and sell this product for it as its agents under their various brands.



## RECENT PATENTS.

**Armored Hose**, William H. Eynon, Cleveland, O., No. 1,068,491. It comprises a tubular rubber body provided with a tubular layer of chain mesh made up of a strip of helically wound chain mesh having its ends vulcanized and spaced from the walls of the tubing.

**Valve Lifter**, Harry C. Rush, Dawson, Penn., No. 1,069,028. A valve lifter having a vertical plate, with its lower part provided with notches and the upper part with recesses adapted to take the operating lever. The last-named object carries a pivoted arm, which engages with the notches, locking the tool to permit of the use of both hands when working on the valve mechanism.

**Lock for Grease Cup**, Robert O. Hughes, Mankato, Minn., assignor of one-half to Bennett Williams of the same place, No. 1,069,071. The cup is formed with a socket on one side parallel to its axis, and the screw plug enclosure is retained by a U shaped locking member, which turns and is held by a spring.

**Windshield Hinge**, Charles H. Jockmus, Ansonia, Conn., No. 1,069,956. It comprises a hinge with a hub and a box adapted to turn on the hub. The hub is provided with a traverse hole and gripping blocks, which engage the hub, a screw passing freely through one block and having a threaded engagement with the other, a spring bearing against the screw and the unthreaded block, and an adjustable locking stop nut being on the screw.

**Signalling Device**, Gustave Fortmann, Philadelphia, assignor to the Auto Safety Signal Company, a corporation of Delaware, No. 1,070,028. It comprises a casing of semi-cylindrical form, having a flared lower end, and a flat transparent bottom secured in the lower section. Horizontal and vertical partitions separate the casing into three sections, in which are placed individual lights. A door closing the casing contains signalling characters in front of the two upper chambers. Provision is also made for a number plate.

**Auxiliary Air Supply Device**, John H. Holton, Lisbon, O., No. 1,070,131. An attachment for installation between the carburetor and the cylinders of a gasoline motor and so constructed that air is drawn into the combustion chamber by the suction of the piston. A valve is incorporated to prevent the air passing in any other direction than to the cylinders. The valve casing is provided with ports for fluids, such as for priming purposes, and there are means for closing the connection between the device and the cylinders, a form of petcock being employed.

## COMING EVENTS.

## August.

- Aug. 25-28—Reliability run, Houston, Tex.
- Aug. 29—Chicago trophy race, Elgin, Ill.
- Aug. 30—Elgin trophy race, Elgin, Ill.
- Aug. 30-Sept. 6—Reliability tour, Chicago, Ill.

## September.

- Sept. 1—Track races, Columbus, O.
- Sept. 1-6—Fire chiefs' convention, Madison Square Garden, New York.
- Sept. 8-15—Around Lake Michigan tour, Chicago, Ill.
- Sept. 9—Speedway meet, Corona, Cal.
- Sept. 10—Track races, Cincinnati, O.
- Sept. 12—Track races, Canfield, O.
- Sept. 12—Track races, Youngstown, O.
- Sept. 13—Track races, Covington, Ky.
- Sept. 13—Track races, Grand Rapids, Mich.
- Sept. 20-21—Track races, Detroit, Mich.
- Sept. 26—Light car race, Boulogne, France.
- Sept. 26-29—Convention, State Firemen's Association, New Bedford, Mass.
- Sept. 29-Oct. 4—American Road Congress, Detroit, Mich.

## October.

- Oct. 12-17—Convention, American Institute of Metals, Chicago, Ill.
- Oct. 12-17—Convention, Carriage Builders' National Association, St. Louis, Mo.
- Oct. 13-18—National fire prevention conference, Philadelphia, Penn.

Oct. 17-25—Electrical Show, Grand Central Palace, New York.

Oct. 24—Convention, American Iron and Steel Institute, Chicago, Ill.

## November.

- Nov. 4-5—Road race, El Paso, Tex.-Phoenix, Ariz.
- Nov. 4-5—Road race, Los Angeles, Cal.-Phoenix, Ariz.
- Nov. 4-5—Road race, San Diego, Cal.-Phoenix, Ariz.
- Nov. 6—Track races, Phoenix, Ariz.
- Nov. 24—Vanderbilt Cup race, Savannah, Ga.
- Nov. 27—Grand Prize race, Savannah, Ga.

## December.

- Dec. 9-12—Convention, American Road Builders' Association, Philadelphia, Penn.
- Dec. 10-12—Convention, Retail Implement & Vehicle Dealers' Association, Milwaukee, Wis.

## January.

- Jan. 3-10—Show, Madison Square Garden, New York City.
- Jan. 24-30—Show, Coliseum, Chicago.
- Jan. 31-Feb. 7—Show, Minneapolis, Minn.

## February.

- Feb. 21-28—Show, First Regiment Armory, Newark, N. J.

## NEW BOOKS RECEIVED.

**What Others Say**, issued by the Duryea Motor Company, Saginaw, Mich. Contains a number of testimonials from various publications and writers bearing upon the two-cycle motor, air-cooling, and other features incorporated in the Duryea Buggyaut, made by this concern.

**New Departure Ball-Bearing Manual**, published by engineering department of the New Departure Manufacturing Company, Bristol, Conn. A treatise on ball bearings, describing and illustrating the removal and replacement of ball bearings, suggestions for proper maintenance, cleaning, enclosure, etc.

**The Flying Merkel Bicycles**, being a catalogue of the bicycles produced by the Miami Cycle & Manufacturing Company, Middletown, O., maker of the well-known Flying Merkel motorcycle. The booklet not only contains a detailed description of the various models produced, but is well illustrated and finely printed.

**A Hand Book on Automobile Electric Systems**, The Electric Auto-Lite Company, Toledo, O. The various electric motor starting and lighting systems are defined and illustrated, and the components explained. Instructions for proper care and maintenance are given very clearly. One of the interesting features of the book is the large chart for locating troubles. The various terms are explained and troubles cross indexed. The book is printed on nice paper and is well illustrated.

**Electrical Installations on Automobiles and Motor Boats**, Packard Electric Company, Warren, O. The contents deals with the various ignition, lighting and starting systems utilized on automobiles and motor boats, and the components and principles involved are explained in a non-technical manner for the benefit of the novice. The book is profusely illustrated, the various wiring plans of ignition systems being plainly lettered and the parts colored to make clear their application. Methods of locating faulty ignition are included in the contents. The laws regulating the operation of motor boats, as well as instructions for care and maintenance of storage batteries, are among the features of the publication.

## BUSINESS DIFFICULTIES.

R-C-H Corporation, Detroit. Security Trust Company, Detroit, receiver. Operation will be continued, to take care of 7000 orders for machines now on file.

Muncie Gear Works, Muncie, Ind. Eugene Vatte, receiver. Liabilities, \$277,061.80; assets, \$204,752.03. Orders now on hand total \$400,000.

Michigan Buggy Company, Kalamazoo, Mich. Detroit Trust Company, Detroit, receiver. Liabilities, \$1,600,000; assets, \$2,000,000.

Webb Company, Allentown, Penn. Robert E. Wilbur recommended to take charge of the business.

Lansden Company, Allentown, Penn. Morton E. Kern, receiver. Liabilities, \$193,000; assets, \$304,046.

Walpole Tire & Rubber Company, Walpole, Mass. Robert C. Fisher, receiver. Liabilities, \$2,773,271; assets, \$4,126,638. Temporarily embarrassed through the failure of the Atlantic National Bank, Providence, R. I., which was carrying some of its paper.

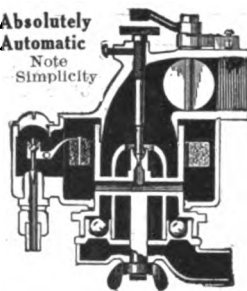


# 40 Gallons Less

With a Planhard

New York  
to Albany  
Race

Absolutely  
Automatic  
Note  
Simplicity



Eisner-  
Lenk Co.

1074 Boylston St.  
Boston, Mass.

Want Dealers in  
New England  
Cities to Handle  
Planhards

June 30, 1918.

Planhard Mfg. Co.—My engine on Excelsior is a home-made 2 cycle 8 cylinder 4 1/2 x 5 inch. The very best I ever did with the 8 carburetor was 380 R. P. M., and I am now making 625 under the same conditions with a Planhard. Two years ago in the New York to Albany race I used 105 gallons of gasoline in 27 hours 57 minutes. This year I only used a trifle over 65 gallons. I had to sell surplus gasoline at Edgewater for 18 cents that I paid 22 for in Albany, as I had no place to store it, so you see how it worked. The race just completed was splendid, and I should have done better time had I followed the New York M. B. C. courses better, but I disobeyed its instructions and ran on a mud flat above Cossackie. Coming back my timer broke when I was off Fishkill Landing and I limped home, making wooden plugs as fast as they were away. However, with all delays the Planhard enabled me to beat my previous record 1 hour 45 minutes. Thomas Trolsen.

## Best Croxton Could Find

The Planhard Mfg. Co.

May 20, 1918.

Gentlemen—We have decided to adopt the Planhard as "Croxton" carburetor equipment because we find it excels all others in economy, power, speed and most important of all in a pleasure car—flexibility.

We determined to make the "Croxton" superior to any automobile in its class in every way, and only the best accessory of its kind, regardless of price enters into its makeup.

Realizing the importance of the carburetor as the most vital single factor in the operation of a car—especially now with the low and variable grades of gasoline commercially available, we determined that the "Croxton" should be the most modern, dependable and faultless, in this all important respect.

With this end in view, we laid out a series of heart-breaking tests for carburetors that would leave no doubt whatever as to the results of our decision. Your carburetor left all others at the post.

We congratulate you on your possession, and wish you every success.

Very truly yours,

THE CROXTON MOTOR CAR CO.,

J. P. Stoltz, President.

## 25 Miles to Gallon on Ford

North Fairfield, O., May 16, 1918.

Gentlemen—After taking the old carburetor off my Ford car and putting on a Planhard, I increased my mileage from 18 to 25 miles per gallon, and my engine, which was a notorious heater, runs as cool as desirable for the best results. I am using 60 to 62 gasoline, and as I have a hydromoter, I know what I am talking about. A. W. Grandon.

# Planhard

The Ultimate Carburetor

Other Distributors

Southern N. J. & Eastern Penn., Gustave Muller, Jr., Bourse Bldg., Philadelphia.  
Hermann Engineering Company, Equitable Building, Detroit, Mich.  
Robt. H. Richter, 180 N-Market St., Chicago.  
J. G. Davis, 1224 Music St., New Orleans, La.

Planhard Mfg. Co., 1790 Broadway, N. Y.

Gentlemen:—Send at once your chart and book concerning Planhard Carburetor.

Name ..... St. ....

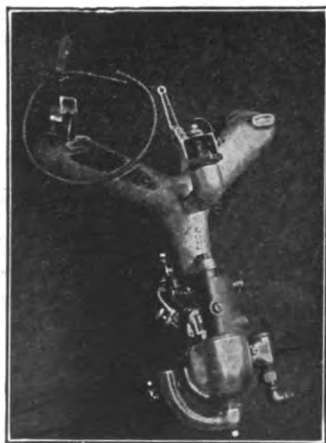
City ..... State .....

Engine ..... Carburetor ..... Size ..... in.

Threaded? Flanged? Horizontal? Vertical?

Pat. Europe.

Pat. America



Showing M&M Attached with 1/4" Elbow.

## TRY THE M & M ECONOMIZER FOR SPEED, POWER AND ECONOMY

### HOW ABOUT THIS LETTER!

Moller Bros., Controller & Economizer Co., Lewistown, Pa.: Auburn, N. Y., August 14th, 1918.

Gentlemen:—I am much pleased with the M&M Economizer that I put on my REO touring car a few weeks ago. I am using a carburetor, which gives a very high mileage per gallon, but with the use of your Economizer I get several more miles per gallon, thereby making a marked saving in gasoline.

It also entirely eliminates the use of brakes, except on very steep grades, which saves much wear on brakes, and I believe is a saving on tires also. It takes a few days' practice to become familiar with the use of the Economizer, but any one will be well paid for their trouble in learning to use it. I would not part with mine for several times the price and cost of installing.

Yours very truly,

(Signed) F. LEE RODGERS.

WHAT COULD BE MORE CONVINCING THAN THE ABOVE LETTER! ALSO, the M&M is guaranteed to do just what we claim, and if it proves unsatisfactory within thirty days, YOUR MONEY WILL BE REFUNDED. (Reference—Citizens National Bank, Lewistown, Pa.)

The M&M is guaranteed to save from 40 to 50% of gasoline, and increase the speed and power 20% with less gasoline, and less carbon. It is the only known carburetor adjuster on the market, and RANKS FIRST AS A CARBON ELIMINATOR. For priming the motor, you cannot find its equal. PLEASE BEAR IN MIND—THERE IS NO SCREEN, or any other obstacle placed in the manifold, as this will have a tendency to CLOG THE MANIFOLD, and make it more difficult for the motor to absorb the gas and air.

Price of the M&M—\$3.50 and 17c extra for postage. We include either friction foot pedal, or steering post control, which consists of flexible shaft and wire. Requires 3/4" pipe tap. Elbow will be furnished upon request.

PRICE OF THE MOTORCYCLE SIZE—\$1.25 Prepaid. Size 1/4".

THE M&M ECONOMIZER IS "THE PATENTED ONE." Warning to users, makers and dealers, PATENT NO. 922,528—May 25, 1909.

WRITE US FOR FURTHER INFORMATION AND CATALOG.

Moller Brothers Controller & Economizer Company, Dept. A  
Main Office and Factory, Lewistown, Pa.

## THE "SIX-48" KEETON

REPRESENTS

The "finer points" of EUROPEAN DESIGN

\$3250 Completely Equipped

Interesting literature sent on request

KEETON MOTOR COMPANY

467 Lawton Ave.,

Detroit, Mich.

## THE MOTOR TRUCK

A National Motoring Magazine Devoted  
Exclusively to the Commercial Field

12 ISSUES

\$1.00 THE YEAR

When Writing to Advertisers, Please Mention The Automobile Journal.

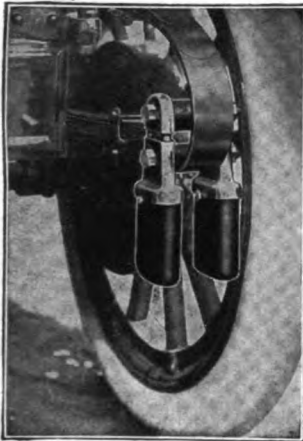


## Don't Accept Anything Else

Insist on having the pioneer, the superior, guaranteed Blackledge Velvet Springs. There are imitations (always are, of every good thing), but don't accept any Shock Absorbing Spring unless you find the name "Velvet" on it. That name means everything to you in the matter of an easy riding motor car. Blackledge "Velvet" Springs are made in the best possible manner of the best possible materials, and are guaranteed to give genuine satisfaction.

### "Just eat up rough going; take out the bumps"

Sixteen sensitive, durable coils support the car, and no matter whether it is a commercial truck, seven-passenger touring car or small runabout, they make riding over roughest cobblestones comfortable and pleasant. Save 35% tire wear, insure against breakage and save wear and tear on entire car. Anyone can attach them in 30 minutes.



## BLACKLEDGE SHOCK ABSORBING VELVET SPRINGS

Elegant, Small, Strong, Durable

(We own the basic patent)

**Desirable, Exclusive Sales Territory Open  
LIVE REPRESENTATIVES WANTED**

Our big advertising campaign is creating sales in every section of the country. There is a lot of desirable territory still open. Write us today and get in on the profits.

**JOHN W. BLACKLEDGE MFG. CO.**

2112 Michigan Avenue

CHICAGO, ILLINOIS

### Infringement Suit

On April 18, 1913, we entered suit in the U. S. District Court, Northern District of Eastern Illinois, against the J. M. Shock Absorber Co. of Philadelphia, account of infringement of our U. S. Patent No. 988,229. Any other infringers will be vigorously prosecuted. Anyone selling or using our infringement device becomes a party to the infringement. We request dealers, the public, to please respect our rights.

### Leading Distributors In These Cities

New York City.  
Providence, R. I.  
Philadelphia, Pa.  
Buffalo, N. Y.  
Baltimore, Md.  
Milwaukee, Wis.  
Galveston, Tex.  
Cincinnati, O.  
Detroit, Mich.  
Springfield, Mass.

Pacific Coast  
Weinstock-Nichols Co.

### Thousands of Car Owners All Over the World Are Using Blue Ribbon Goods



Blue Ribbon Metal Polish  
Blue Ribbon Nickel Polish  
Blue Ribbon Auto Body Gloss  
Blue Ribbon Radiator Leak-proof Cement

All BLUE RIBBON products strictly high class and fully guaranteed. BLUE RIBBON moves quick for the dealer—works fast for the consumer.

Ask for sample, giving us name of Dealer or Jobber

**INTERNATIONAL METAL POLISH COMPANY**

Quill and Naomi Streets, Indianapolis, Indiana

W. A. Blackburn, Eastern Distributor, 335 Broadway, Moffat Bldg., New York

FOUR CYLINDER MODELS THE CAR THAT MADE SIX CYLINDER MODELS



Manufacturers of Klaxon Horn say that the reason they recommend Burn-Bostons is because "the ordinary dry cell lasts four to six weeks for ordinary touring purposes before the voltage runs too low"—Burn-Bostons on two test runs conducted by the Klaxon people sounded the equivalent to fifty calls per day for two years.

If your dealer hasn't them send us his name and we'll see that you are supplied

**BURN-BOSTON BATTERY,** 19 Doane St. BOSTON, MASS.

## AUTOMOBILE TURNTABLES

BOOKLET ON REQUEST  
THE T. C. BEACH CO.

REPRESENTATIVES WANTED  
108 Ottawa Street, St. Johns, Mich.

### GYROSCOPE PRINCIPLE

The New Jones Speedometer Unaffected by Heat or Cold

Any motor car maker will equip with it if you state plainly you want nothing else, no matter what speedometer he may list in his catalog as equipment.

Write us for facts, test and experiments that show Jones supremacy beyond question.

**THE JONES SPEEDOMETER**—Broadway at 76th Street, NEW YORK

## KISSEL KAR Every Inch a Car

made complete in one factory, under a system of inspection that obtains a perfection of detail surpassed in no other car. Investigate.

KISSEL MOTOR CAR CO., 174 Kissel Ave. HARTFORD, WIS.

When Writing to Advertisers, Please Mention The Automobile Journal.



# The "Black Eagle" Spark Plug

PATENTED

## 50 Cents Is Enough

The "Black Eagle" Spark Plug has made good because it was designed and manufactured with this result in view.

A person in close touch with the supply and manufacturing ends of the trade was a visitor at our factory recently, and was shown the details of construction, including the machinery, testing, and assembling of the "BLACK EAGLE" Spark Plug. What he said we believe will be of interest to you, as it indicates the effort on our part to supply a high grade plug at a reasonable price. We therefore quote below his impressions.

"I am simply amazed at the workmanship, material, and construction of the 'BLACK EAGLE' Spark Plug. When I saw this plug advertised at a price of 50c to the consumer, I naturally supposed it was a cheap, common, plug such as you occasionally find in jobbing houses on the bargain counter. I am convinced, after seeing these plugs tested, and examining minutely the machine parts which enter into their construction, that no better porcelain spark plug is offered by any one, regardless of the price they ask."

We are not influenced by what our competitors charge for spark plugs! We have ignored price precedent, for the reason that a high grade spark plug can be manufactured and sold at 50c each, and that is enough.

Sent prepaid on receipt of price. Made in all standard threads.

**THE STANDARD CO.**

**Torrington, Conn., U. S. A.**



**"THE WELDING" COMPANY**  
 SPRINGFIELD BOSTON HARTFORD HOLYOKE  
 BRIDGEPORT SALEM  
 All Parts of Any Metal Welded and Guaranteed  
 ALUMINUM CASES AND CAST IRON CYLINDERS A SPECIALTY

### How Largest Profits Are Made

We have some interesting facts in connection with increasing your car sales and profits.

Through merchandising strategy we have remedied these flaws. May we tell you about these things and about our kerosene-burning car, equipped with wire wheels, cowl dash, cowl fuel tank? Left drive, center seat control, the most salable car offered today. Write or wire for the facts.

Henderson Motor Car Co., Indianapolis, Ind.

50

*National*  
 STOCK CHAMPION  
 FIVE MODELS Electric Starter Electric Lights \$2750 to \$3400  
 National Motor Vehicle Co., Indianapolis

*Mea*  
 Magneto  
 S. R. O. BALL BEARING  
 MARBURG BROS., Inc.,  
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 Detroit. 1790 Broadway, New York. Chicago

**MIGHTY MICHIGAN "40"**  
 40-Horsepower Touring Car or Roadster, absolutely silent in operation. Oversize tires 35x4 1-2---cylinders 4 1-4x5 1-4 in.---118-in. wheel base---four-forward-speed transmission---dismountable rims---nickel mountings---massive, straight-line body---big, roomy seats---electric lighting by generator---everything. Price \$1685, includes full equipment. We also make a 33 H. P. model. Catalog on request.  
 (163) MICHIGAN MOTOR CAR CO., 185 Lay Blvd., Kalamazoo, Mich.

**WORN OUT TIRES RENEWED**  
 AND  
 Guaranteed for 3000 Miles  
 BY THE  
**INVINCIBLE PROCESS**  
 It costs less than a new tire. Write for particulars  
**INVINCIBLE TIRE COMPANY**  
 53 Sabin Street PROVIDENCE, R. I.

When Writing to Advertisers, Please Mention The Automobile Journal.



**"The Car of No Regrets"**  
**\$1095** with Equipment  
 Ward Leonard Starter and Generator  
 for \$100 net additional

# KING

See the KING—then buy! It's fairness to yourself. You can't afford to purchase *any* car until this highest of motor values has been investigated. The KING gives *more* service, comfort, style, and convenience than can be had in any car near its price, and has desirable, patented features which *no other* car can offer.

## FEATURES OF MODEL B, 30-35 HORSE-POWER

*Two Styles—One Chassis—Touring Car and Roadster*

Cantilever Rear Springs  
 Long-stroke Motor  
 Unit Power Plant

Three-point Suspension  
 Gemmer Steering Gear  
 Complete Electric Lighting

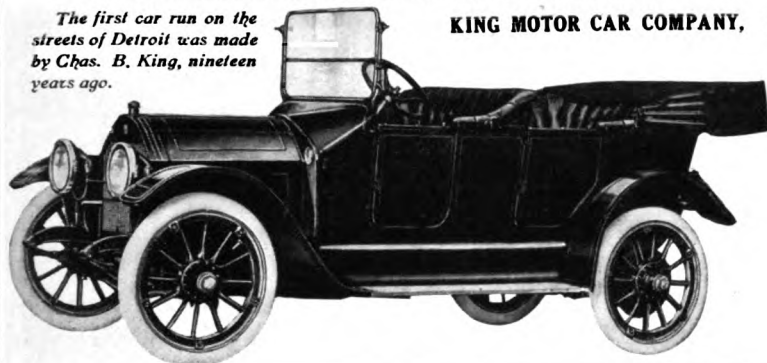
Full-floating Rear Axle  
 Left-hand Steer  
 18-inch Steering-wheel

Hyatt Roller Bearings  
 Center Control  
 112-inch Wheel-base

Briggs Magneto  
 Stromberg Carburetor  
 20-inch Rear Doors

Rain-vision Ventilating Windshield; Silk Mohair Top; Quick-attachable Curtains; Quick-detachable Rims; Stewart Warner Speedometer (listed \$50); Electric Horn; Extra Rim; Tire-irons; Pump; Jack; Tire-repair Outfit; Tools, etc., all in regular equipment

*The first car run on the streets of Detroit was made by Chas. B. King, nineteen years ago.*



**KING MOTOR CAR COMPANY, 1300 to 1324 Jefferson Ave., Detroit, Mich.**

New York Agency and Showrooms,  
 Broadway at 53d St.

New York Service Department,  
 244 to 252 West 54th St.

**AGENCY FOR CANADA**  
 King Motor Sales Co. of Canada,  
 London, Ontario

**ATTENTION, AGENTS!** Every KING sold sells others. If we could show the KING to every prospective purchaser of a moderate-priced car, we could sell a year's output monthly. In service and style, it far exceeds any car of its class. Write or wire today for territory.



The Thoroughbred Car.

Live wire dealers, write for unallotted territory.  
**HERRESHOFF MOTOR COMPANY, Detroit, Mich.**

Electric self-cranking, electrically lighted.  
 Four Forward Speeds.

"Six Thirty-Six" Touring Car and Roadster - \$1850  
 Model 30 Touring Car - \$1350  
 Model 30 Roadster - \$1250

## EVERYTHING FOR THE AUTOMOBILE

**WAITE AUTO SUPPLY CO.**  
**Manufacturers and Jobbers**

**81 Exchange Place Providence, R. I.**

## STANWELD RIMS

Mechanically correct—easy to operate—perfect in material and workmanship. Used as standard equipment on the better cars.

**THE STANDARD WELDING COMPANY Cleveland, Ohio**

DON'T let rim rust destroy your tires;  
 Paint them twice a season with

**THOMAS' ANTI RIM RUST PAINT**

One dollar a can at your dealers, or write us

**The Anti-Rust Paint Co., Dept. 7, Akron, Ohio**

# SPLITDORF

*"Always There"*

The SPLITDORF "T S" TRANSFORMER is interchangeable with any type tube or dash coil and can be attached to any car. We will make a very liberal allowance on an old coil in exchange for one of the new style.

Write TODAY for particulars

**SPLITDORF ELECTRICAL CO.**

98 Warren Street, Newark, N. J.

Discard the Hand Pump. Join the Satisfied Army. Get a  
**Brown Impulse Tire Pump**

Write for information to

**The Brown Company,**

1075 S. Clinton St.,

Syracuse, N. Y.

## MAXWELL MOTOR COMPANY (Inc.)

**DETROIT,**

**U. S. A.**

When Writing to Advertisers, Please Mention The Automobile Journal.





One Pound Rolls  
A Convenient and Attractive  
Package of Cotton Waste for  
**AUTOMOBILE AND  
MOTOR-BOAT USE**

In rolls, opening on end, packed with 12 convenient handfuls, each one of which can be taken out without spoiling the rest of the package

**HANDY** FOR THE TOOL-BOX  
FOR THE GARAGE  
FOR HOUSEHOLD USE

ASK YOUR SUPPLY HOUSE FOR THESE GOODS  
**UNION WADDING COMPANY**  
PAWTUCKET : RHODE ISLAND



**MULTIBESTOS**

The Brake Lining of Quality.

**BRINGS**

Sales to the Dealer  
Safety to the Owner  
Service all Around

Adopted after test as regular equipment on Quality Cars. Woven of the purest of asbestos and treated by an exclusive formula. Multibestos has the highest co-efficient of friction and wears most uniformly through the longest life.

**Standard Woven Fabric Co., Framingham, Mass.**

SALES BRANCHES:  
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San Francisco, Fred Ward & Son, Inc.

**DIXON'S MOTOR  
GRAPHITE**

Makes a Motor Run Easier, Faster, and Longer and Saves Lubrication Cost. Write for the Book "Lubricating the Motor," No. 210.

**JOSEPH DIXON CRUCIBLE CO.**

Jersey City (1) New Jersey



**FOR YOUR AUTO OR GARAGE**

Pyrene is the only effective extinguisher of gasoline fires.

Pyrene is non-damaging and non-corrosive.

Write for Booklet

**PYRENE COMPANY OF NEW ENGLAND**

176 Federal Street, Boston, Mass.

# Hotel Belleclaire

Broadway and 77th Street

(Subway 79th)

## NEW YORK

Situated in the most charming Residential Section of New York City, having an uninterrupted view of the Hudson River and Riverside Park, making it a delightfully cool residence. This hotel appeals to visitors and those seeking a refined and Home-like Hotel. Cuisine the best. Handsome Restaurants and Palm Room. Headquarters of the Army and Navy. Special Rates at this season of the year.

Room with bath, \$2.00 up

Two Rooms with bath, \$3.50 up

**ROBT. D. BLACKMAN, Manager.**

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**RUBY  
All-Steel Garages**

An absolutely fireproof building, neat in appearance, with the strength of a skyscraper. Can be erected during your spare time. Small touring car size \$120. Other sizes in proportion. All of our buildings carry a fifteen year bank bond guarantee. Steel buildings for every purpose.

**KOLB SALES CO.**  
United States Rubber Bldg.  
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## J-M AUTOMOBILE SUPPLIES

Brake Lining  
Spark Plugs  
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Radiator Shields

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NEW YORK AND EVERY LARGE CITY

## Your tire troubles are over if your car is equipped with Dayton Airless Tires

Send for "Catechism"; shows you how motoring expense can be cut down and motoring pleasure increased.

Dayton Rubber Mfg. Co., 1011 Kiser St., Dayton, Ohio

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# Classified Buyers' Guide

A Handy Reference for Purchasers

## ACCESSORY MANUFACTURERS AND JOBBERS.

**Auto Parts Co.**, Providence, R. I.  
**Hopewell Brothers**, Newton, Mass.  
 Branch: 1974 Broadway at 67th St., New York.  
**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.  
**Miller, Chas. E.**, 97-103 Reade St., New York.  
 Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 259 Peachtree St., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.  
**Milwaukee Auto Specialty Co.**, 128 Second St., Milwaukee, Wis.  
**Shaler Co.**, C. A., Waupun, Wis.  
**Waite Auto Supply Co.**, 81 Exchange place, Providence.

## ACETYLENE TANKS. (See Tanks.)

## ADJUSTERS.

**Vansickle, John A.**, Indianapolis. (Ford Ideal Ball and Socket Joint.)

## AIR COMPRESSORS AND TANKS.

**Williams Foundry & Machine Co.**, Akron, O.

## AMMETERS AND VOLTMETERS.

**Hoyt Electrical Instrument Works**, Penacook, N. H.

## AUTO LOCKS. (See Locks.)

## AUTOMOBILES. (See Cars.)

## AUTOMOBILE SPECIALTIES.

**Sumner, George, Inc.**, 1926 Broadway, New York.

## BALLS AND BALL BEARINGS.

**Boyd, F. Shirley**, 903 Boylston St., Boston. (R. I. V.)  
**Brets Co.**, J. S., 250 W. 54th St., New York. (F. & S.)  
**Marburg Bros., Inc.**, 1790 Broadway, New York. (S. R. O.)  
**New Departure Mfg. Co.**, Bristol, Conn. (New Departure.)  
**R. I. V. Co.**, 1771 Broadway, New York. (R. I. V.)

## BATTERIES.

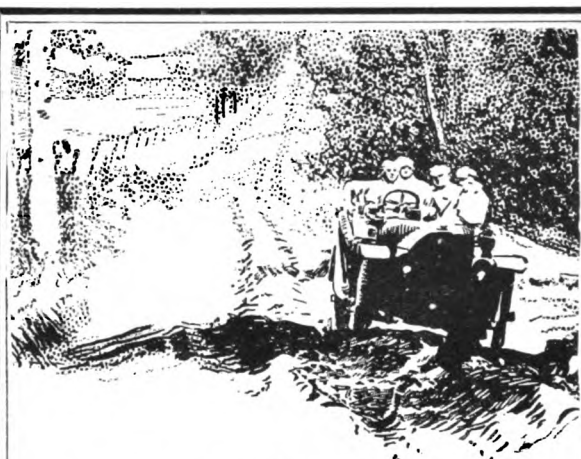
**Burn-Boston Battery Co.**, 19 Doane St., Boston. (Burn-Boston.)  
**Electric Storage Battery Co.**, Philadelphia. (Exida.)  
**Geissler Bros. Storage Battery Co.**, 514 W. 57th St., New York.  
**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City. (J-M.)  
**Waite Auto Supply Co.**, 81 Exchange place, Providence. (Success.)  
**Willard Storage Battery Co.**, 5716 Euclid Ave., Cleveland. (LEA Lighting and Starting.)  
 Branches: 136 West 52nd St., New York; 1191 Woodward Ave., Detroit; 2241 Michigan Ave., Chicago; 243 Monadnock Bldg., San Francisco.

## BATTERY EXTINGUISHERS.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.

## BLOW-OUT PATCHES. (See Patches.) (Continued on Next Page.)

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# GET EVERY MILE

THAT YOUR GASOLINE  
HAS IN IT

# Polarine

puts the power in the  
drive wheels—all of it.

Polarine ends carbon  
troubles—stops friction  
and makes repair bills  
shrink.

Polarine your car.

In half-barrels and bar-  
rels, gallon and five-gal-  
lon cans.

Use Standard Oil  
Company's Gasoline

At All Dealers or



# STANDARD OIL COMPANY

OF NEW YORK



# NOTICE

We respectfully call attention to the fact that the Knox Automobile Company is the only other manufacturer licensed to build tractors under the "Martin" patents and other patents owned by Mr. C. H. Martin. These patents, we believe, cover every possible, practical combination of a self-supporting and steerable tractor, with a non-self-supporting trailer. The patents comprise the following: —

|        |            |               |
|--------|------------|---------------|
| Hunter | 670,405,   | Mar. 19, 1901 |
| Hunter | 696,143,   | Mar. 25, 1902 |
| Hunter | 625,953,   | May 30, 1899  |
| Thayer | 678,063,   | July 9, 1901  |
| Martin | 1,018,248, | Feb. 20, 1912 |
| Hight  | 698,836,   | Apr. 29, 1902 |
| Liebau | 655,724,   | Aug. 14, 1900 |

and numerous applications are now pending in the United States Patent Office.

This notice is merely in the nature of general information.

**MARTIN TRACTOR COMPANY**  
SPRINGFIELD, MASS.

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STARTS—LIGHTS—IGNITES

Six Volt System Does It All.  
Write for our magneto exchange offer.

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## REO THE FIFTH

Final and crowning achievement of R. E. Olds, pioneer designer of autos. A standard size 30 to 35 Horsepower four cylinder car of modern refinements priced at only \$1,035.

R. M. OWEN & CO., General Sales Agents  
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|                                      |                 |         |
|--------------------------------------|-----------------|---------|
|                                      | <b>MODEL 77</b> |         |
| 6 Cylinders, 41-2x7                  |                 | \$6,000 |
|                                      | <b>MODEL 66</b> |         |
| 6 Cylinders, 41-2x5 1-2              |                 | \$5,000 |
|                                      | <b>MODEL 55</b> |         |
| 6 Cylinders, 4x5                     |                 | \$4,000 |
| Some desirable territory still open. |                 |         |
| <b>AUSTIN AUTOMOBILE CO.</b>         |                 |         |
| Grand Rapids, Mich.                  |                 |         |

## GEORGE SUMNER, Inc.

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"S U" CARBURETOR

1926 BROADWAY NEW YORK

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## (BUYERS' GUIDE—Continued.)

### BODIES, TRUCK.

Motor Truck Body Co., 320 Franklin St., Detroit.

### BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

### BRAKE BANDING OR LINING.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (J-M Non-Burn.)

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)

Standard Woven Fabric Co., Worcester, Mass. (Multi-bestos.)

Branches: 903 Boylston St., Boston; 276 Canal St., New York; 720 Main St., Buffalo; 422 River St., Troy, N. Y.; 1427 Vine St., Philadelphia; 1430 Michigan Blvd., Chicago; 1598 Woodward Ave., Detroit; St. Louis; San Francisco.

### BRAKES.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

### BRUSHES, WIRE.

Williams Foundry & Machine Co., Akron, O.

### BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

### CABLES. (See Wires.)

### CARBURETORS.

Planhard Mfg. Co., 1790 Broadway, New York. (Planhard.)

Sumner, George, Inc., 1926 Broadway, New York. (S. U.)

### CARS—ELECTRIC PLEASURE.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)

Baker Motor Vehicle Co., Cleveland. (Baker.)

### CARS—GASOLINE PLEASURE.

Abbott Motor Co., 141 Waterloo St., Detroit. (Abbott-Detroit.)

Austin Automobile Co., Grand Rapids, Mich. (Austin.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Cole Motor Car Co., Indianapolis, Ind. (Cole.)

Empire Automobile Co., Indianapolis, Ind. (Empire, Little Aristocrat.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Henderson Motor Car Co., Indianapolis. (Henderson.)

Herreshoff Motor Co., 620 Harper Ave., Detroit. (Herreshoff.)

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Keeton Motor Co., Detroit. (Keeton.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

K-R-I-T Motor Car Co., Detroit. (K-R-I-T.)

Maxwell Motor Co., Inc., Detroit. (Maxwell.)

Mercer Automobile Co., 1100 Whitehead Road, Trenton, N. J. (Mercer.)

Michigan Motor Car Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)

National Motor Vehicle Co., 1033 22d St., Indianapolis. (National.)

Nordyke & Marmon Co., Indianapolis. (Marmon.)

Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)

Paige-Detroit Motor Car Co., Detroit. (Paige.)

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

(Continued on Next Page.)



(BUYERS' GUIDE—Continued.)

**Speedwell Motor Car Co.**, 80 Essex Ave., Dayton, O. (Speedwell.)

**Stutz Motor Car Co.**, Indianapolis. (Stutz.)

**White Co., The**, 828 E. 79th St., Cleveland. (White.)  
Branches: 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

**Willys-Overland Co.**, Toledo, O. (Overland.)

**CARS—STEAM PLEASURE.**

**White Co., The**, 828 E. 79th St., Cleveland. (White.)  
Branches: See Cars—Gasoline Pleasure.

**CARS—GASOLINE COMMERCIAL.**

**Adams Bros. Co.**, Findlay, O. (Adams.)

**Available Truck Co.**, 2334 Hamilton Ct., Chicago. (Available.)

**Bessemer Motor Truck Co.**, Grove City, Penn. (Bessemer.)

**Blair Mfg. Co.**, Newark, O. (Blair.)

**Brown Commercial Car Co.**, Peru, Ind. (Brown.)

**Cartercar Co.**, Pontiac, Mich. (Cartercar.)

**Clark, E. S.**, 242 Freeport St., Dorchester District, Boston. (Clark.)

**Dart Manufacturing Co.**, Waterloo, Ia. (Dart.)

**Driggs-Seabury Ordnance Corp.**, Sharon, Penn. (Vulcan.)

**Federal Motor Truck Co.**, Junction and Leavitt Sts., Detroit. (Federal.)

**Garford Co.**, Elyria, O. (Garford.)

**General Motors Truck Co.**, 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)

Branches: New York, Chicago, Boston, Philadelphia, Kansas City.

**Gramm-Bernstein Co.**, Lima, O. (B. A. Gramm's.)

**Knox Automobile Co.**, Springfield, Mass. (Knox.)

**Owen & Co., R. M.**, 19 W. 62d St., New York City. (Reo.)

**Pierce-Arrow Motor Car Co.**, Buffalo, N. Y. (Pierce-Arrow.)

**Reo Motor Car Co.**, Lansing, Mich. (Reo.)

**Sullivan Motor Car Co.**, 611 East Ave., Rochester, N. Y. (Sullivan.)

**Willys-Overland Co.**, Toledo, O. (Overland.)

**CARS—ELECTRIC COMMERCIAL.**

**Anderson Electric Car Co.**, 458 Clay Ave., Detroit. (Detroit Electric.)

**Atlantic Vehicle Co.**, Factory, Newark, N. J.; 1600 Broadway, New York City; 10 Postoffice Sq., Boston. (Atlantic.)

**Baker Motor Vehicle Co.**, Cleveland. (Baker.)

**Couple-Gear Freight-Wheel Co.**, 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)

Branches: 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.

**General Motors Truck Co.**, 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)

Branches: See Cars—Gasoline Commercial.

**General Vehicle Co.**, Long Island City, N. Y. (G. V.)

**CARS—FIRE, POLICE AND MUNICIPAL SERVICE.**

**Cartercar Co.**, Pontiac, Mich. (Cartercar.)

**Couple-Gear Freight-Wheel Co.**, 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)

Branches: See Cars—Electric Commercial.

**Knox Automobile Co.**, Springfield, Mass. (Knox.)

**White Co., The**, 828 E. 79th St., Cleveland. (White.)

Branches: See Cars—Gasoline Pleasure.

**Willys-Overland Co.**, Toledo, O. (Overland.)

**CATALOGUE SYSTEMS.**

**Catalogue Systems Co.**, Fisher Bldg., Chicago, Ill.

**CEMENTS.**

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.

(Continued on Next Page.)

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# HERZ PLUG

Eventually you will disregard the cheap hardware commonly called "Spark Plugs," and use the HERZ PLUG—the only Plug that is or can be

**Guaranteed a Year**

The usual Spark Plug troubles are unknown to users of the HERZ PLUG. Once installed, it never is taken out.

Double Blue-Enamel Stone

No Sooting—No Cleaning—No Porcelain—No Breakage.

**No Experiment: In its 20th Year**

Price \$1.50 postpaid. Ask your dealer, or write us.

We also make the HERZ MAGNETO

**HERZ & CO.**  
295 Lafayette St. New York.



The RIGHT way to light the way

Give up gas and oil lamps for the

## APLCO ELECTRIC LIGHTING SYSTEM

Can be installed on the car you drive at little expense. Write us.

**THE APPLE ELECTRIC CO.**  
74 Canal St., Dayton, Ohio

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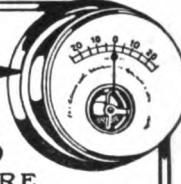
## HOYT METERS

AND GET YOUR MONEY'S WORTH

## HOYT ELECTRICAL WORKS

INSTRUMENT

PENACOOK, NEW HAMPSHIRE



**EDWARDS FIREPROOF STEEL**


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For Automobiles and Motorcycles

**\$30 and Up**

Easy to put up. Portable. All sizes. Postal brings latest illustrated catalog.

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414-464 Eggleston Ave., Cincinnati, Ohio





## SAGER EQUALIZERS

The Shock Absorbers Which Save Your Car and Tires.  
Nothing to Wear, Adjust or Require Attention.  
They Take The "Sting" Out of Rough Roads.  
Try Them At Our Expense For 30 Days.

Seven Years Of Success.

ENDORSED BY:

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Elmore  
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Franklin  
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Logan  
Crawford  
Meteor  
and Jewel

THOUSANDS OF DOLLARS  
Saved Annually by Use of Sager Bumpers.  
Don't Wait for a "Smash-up" to Buy Protection.  
DO IT NOW.

PRICES \$6.00 to \$27.50.

Liberal Discounts.



Used Almost Exclusively On High Grade Cars.  
Channel



Rochester



Clamp-on Bumpers of Distinction. 30 Models. Attached in 10 Minutes.  
FORD SPECIAL, CLAMPED ON, \$10.

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271 South Avenue, Rochester, N. Y.

*Elyria-Dean*

Trade Mark

ELECTRICAL APPARATUS OF QUALITY

Tuto, Rexo and Tally-Ho Horns  
Speedometers, Ignition, Starting and Lighting Systems

THE DEAN ELECTRIC COMPANY 506 Olive St., ELYRIA, O.

**PAIGE** "36"—\$1275  
"25"—\$ 950

Leaders of popular-priced cars—thoroughly built, completely equipped, backed by a strong organization. Specifications and catalog on request.

**PAIGE-DETROIT MOTOR CAR CO.**  
306 21st Street, Detroit, Michigan

## (BUYERS' GUIDE—Continued.)

### CHAINS, TIRE, AND ANTI-SKIDDING DEVICES.

Weed Chain Tire Grip Co., 28 Moore St., New York.  
(Weed.)

### CHAINS—TRANSMISSION OR DRIVING.

Boyd, F. Shirley, 903 Boylston St., Boston. (Baldwin.)  
Miller, Chas. E., 97-103 Reade St., New York. (Bramp-  
ton.)  
Branches: See Accessory Manufacturers and Job-  
bers.)

### CLOCKS FOR DASHBOARDS, ETC.

Boston Clock Co., 16 State St., Boston.  
Chelsea Clock Co., 16 State St., Boston.

### CLUTCHES—AUTOMOBILE FRICTION.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford  
Cone.)

### COILS.

Heinze Electric Co., Lowell, Mass.  
New York Coil Co., 338 Pearl St., New York City.

### CONTROLLERS AND ECONOMIZERS.

Moller Brothers Controller & Economizer Co., 700 Bets  
Bldg., Philadelphia. (M&M.)

### CYLINDER CLEANING COMPOUND.

Milwaukee Auto Specialty Co., 128 Second St., Milwau-  
kee.  
Prest-O-Lite Company, 271 East South St., Indianapo-  
lis. (Prest-O-Carbon Remover.)  
Branches: Atlanta, Baltimore, Boston, Buffalo, Chi-  
cago, Cincinnati, Cleveland, Dallas, Denver, De-  
troit, Indianapolis, Jacksonville, Kansas City, Los  
Angeles, Milwaukee, Minneapolis, New York,  
Omaha, Philadelphia, Pittsburgh, Providence, San  
Francisco, Seattle, St. Louis and St. Paul.

### FIRE EXTINGUISHERS.

Pyrene Co. of New England, 176 Federal St., Boston.  
(Pyrene.)

### FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge,  
Mass. (Dover.)

### GASKETS.

Brown Co., Inc., Chas. D., 49 Federal St., Boston. (Vel-  
lumoid.)

### GAUGES.

National Motor Supply Co., 1911 Euclid Ave., Cleve-  
land. (Tire Pressure and Gasoline Tank.)  
Branches: In all principal cities.

### GEARS, STEERING.

Ross Gear & Tool Co., 794 Heath St., Lafayette, Ind.  
(Ross.)

### GUNS, GREASE. (See Oil Pumps.)

### HEADLIGHTS.

Sumner, George, Inc., 1926 Broadway, New York City.  
(Diva.)

### HORNS.

Dean Electric Co., Elyria, O. (Tuto.)  
Randall-Falchney Co., Boston. (Jericho, Jubilee.)  
Branch: 918 Eighth Ave., New York.

(Continued on Next Page.)

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(BUYERS' GUIDE—Continued.)

HOUSES, PORTABLE STEEL.

Kelb Sales Co., 1790 Broadway, New York. (Ruby.)

INSULATION.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)  
Branch: 1974 Broadway, New York.

LICENSE NUMBER BRACKETS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.  
Branches: In all principal cities.

LIGHTING SYSTEMS, ELECTRIC.

Apple Electric Co., Dayton, O. (Apico.)  
Dean Electric Co., Elyria, O. (Dynalux.)  
Remy Electric Co., Anderson, Ind. (Remy.)

LOCKS, AUTOMOBILE.

Bracelet Auto Lock Co., 32 No. Clark St., Chicago.

LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York. (Colonial.)  
Branches: Boston, Fall River, Philadelphia.  
Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)  
Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagle-line No-Karbon.)  
Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)  
Branch: 143 No. Wabash Ave., Chicago.  
Haws, Geo. A., 142-144 Front St., New York. (Panhard.)  
Branch: 899 Boylston St., Boston.  
Indian Refining Co., 17 Battery Place, New York. (Distributors of Havoline Oil.)  
Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Building, Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.  
Refineries: Georgetown, Ky.; Lawrenceville, Ill.  
Invader Oil Co., 80 Broad St., New York. (Invader.)  
Branches: 284 Columbus Ave., Boston; 113 Arch St., Philadelphia; 3556 11th St., N. W., Washington, D. C.  
Miller, Chas. E., 97-103 Reade St., New York. (Pan-American.)  
Branches: See Accessory Manufacturers.  
New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)  
Standard Oil Co., New York. (Polarine.)  
Branches: In all cities.  
Texas Company, The, 7 West St., New York.  
Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.  
Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)  
Branches: 49 Federal St., Boston; 29 Broadway, New York; Fourth and Chestnut Sts., Philadelphia; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.; Fisher Bldg., Chicago; Ford Bldg., Detroit; Indiana Pythian Bldg., Indianapolis.  
Valvoline Oil Co., 27 State St., Boston. (Valvoline.)

MAGNETOS AND SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York.  
Branches: 119-121 E. 24th St., Chicago; 1250 Woodward Ave., Detroit; 367 Van Ness Ave., San Francisco.  
Brets Co., J. S., 250 W. 54th St., New York. (U. & H.)  
Helme Electric Co., Lowell, Mass. (Heco.)  
Marburg Bros., 1790 Broadway, New York. (Mea.)  
Remy Electric Co., Anderson, Ind. (Remy.)

(Continued on Next Page.)

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**Care and Repair of Tires**

**GET THIS AUTOTIRE BOOK FREE**

Here is a handy little book brimful of practical points which every automobile owner wants to know. Gives all kinds of information about tires—how to prevent troubles, how to repair best, quickest and at least expense. Tells about the wonderful machine, the

**SHALER Electric Vulcanizer**

"It Makes One Tire Outwear Three." The Shaler repairs any kind of puncture, cut, blow-out, or tear in any outer casing or inner tube. Automatic—makes a perfect weld. Never burns or undercures. For garage or home use, direct or alternating current, or for road use with alcohol. \$10 up. Costs ½ c per hour to operate. Absolutely guaranteed. Send Your Name Today and we will mail our interesting tire book "Care and Repair of Tires." Gives a remedy for every tire emergency. It's free postpaid.

Garage and Repairmen should also write for our money making hand book.

**C. A. SHALER CO., 961 4th St., Waupun, Wis.**

**GOOD YEAR**  
AKRON, OHIO

This name on Automobile Tires and Rubber Accessories signifies inherent qualities of material and workmanship that insure the maximum of service at the minimum of expense.

**THE GOODYEAR TIRE & RUBBER COMPANY, AKRON, OHIO (672)**

**Cartercar**

With the gearless transmission—will give better service than is possible for a gear car. Unlimited speeds—climbs steep hills—gives double the usual tire mileage.

**CARTERCAR COMPANY, Pontiac, Mich.** Send for catalog

**Abbott-Detroit**

"The demand of the day is that an organization shall be judged by its product and not by what it claims for itself." Keep this in mind when you examine the 1913 models of the Abbott-Detroit.

Advance Catalog on Request.

**ABBOTT MOTOR CO.**  
141 Waterloo St. Detroit, Mich.  
"Built for Permanence"

**GEISZLER NON-SULPHATING STORAGE BATTERIES**

Guaranteed perfect satisfaction or money refunded

**SIZE 66 - \$20.00**

**GEISZLER BROS. STORAGE BATTERY COMPANY**  
514 West 57th Street, New York City

The Fastest Riding Car in the World

**MARMON**

NEW SERIES MARMON "32" F. E. WING MOTOR CAR CO.  
\$2850 to \$4100 "Motor Mart"  
**THE MARMON SIX** 12 Columbus Ave., BOSTON  
\$5000 to \$6350 New England Dealers for

**NORDYKE & MARMON CO., Indianapolis, Ind.**



100% EFFECTIVE



GAULOIS TIRE CORP.

1926 BROADWAY

NEW YORK

Canadian Agency: 325 St. James Street, Montreal.

**Jericho** ONE TONE **Horn**THE PERFECT SIGNAL  
OVER 100,000 NOW IN USEWARNS WITHOUT OFFENCE—ALWAYS EFFECTIVE  
NEVER CLOGS OR BALKS—SIMPLE TO INSTALLCOSTS \$7.00 TO \$10.00  
NO MAINTENANCE COSTB-Line Cuns and MacKae Blitz Spark  
Plugs are Best.THE RANDALL-FAICHNEY CO.  
BOSTON, Mass.JUBILEE  
(CHIME TONE)**Jubilee** CHIME TONE **Horn****Tarvia**PREVENTS DUST  
PRESERVES ROADS

Booklets on request

BARRETT MANUFACTURING CO.

New York, Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburgh,  
Cincinnati, Kansas City, Minneapolis, Corey, Ala.INSIST ON GETTING  
**Colonial Motor Oil**

No substitute "just as good"

**Borne, Scrymser Company**

NEW YORK BOSTON FALL RIVER PHILADELPHIA

**Jackson**No Hill Too Steep  
No Sand Too Deep

|             |   |        |
|-------------|---|--------|
| OLYMPIC     | - | \$1500 |
| 4 cylinders |   |        |
| MAJESTIC    | - | \$1975 |
| 4 cylinders |   |        |
| SULTANIC    | - | \$2500 |
| 6 cylinders |   |        |

JACKSON AUTOMOBILE CO., 1203 East Main St. Jackson, Mich.

## (BUYERS' GUIDE—Continued.)

**Splitdorf Electrical Co.**, 98 Warren St., Newark, N. J.  
Branches: 10-20 W. 63rd St., New York; 1110 S. Michigan Ave., Chicago; 180-182 Massachusetts Ave., Boston; 1028 Geary St., San Francisco; 972 Woodward Ave., Detroit; 1228 S. Olive St., Los Angeles, Cal.; S. W. Corner Cherry and Juniper Sts., Philadelphia; 1823 Grand Ave., Kansas City; 1628 Broadway, Seattle, Wash.; London, Eng.; Buenos Aires.

## MEASURES.

**Dover Stamping & Manufacturing Co.**, Cambridge, Mass. (Auto and Savol.)

## MIXING DEVICES, GASOLINE.

**Approved Auto Specialties Co.**, 1731-37 Broadway, New York. (Wolf.)

**Royal Equipment Co.**, 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

## MOTORCYCLES AND SUPPLIES.

**American F. N. Co.**, Boston. (F. N.)  
Branches: 49 Union St., Providence; 415 Trumbull St., Hartford, Conn.

**Miami Cycle & Manufacturing Co.**, 320 Hanover St., Middletown, O. (Flying Merkel.)

## MOTORING ORGANIZATIONS.

**Federation American Motorcyclists**, E. M. Estabrook, Bangor, Me.

## MOTORS AND POWER PLANTS.

**Rutenber Motor Co.**, Marlon, Ind. (Rutenber.)

## MOTOR STARTERS.

**Apple Electric Co.**, Dayton, O. (Aplico.)

**Remy Electric Co.**, Anderson, Ind. (Remy.)

## PACKING, FIRE.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.

## PAINT, ANTI-RUST.

**Anti-Rust Paint Co.**, Dept. 7, Akron, O. (Thomas.)

## PATCHES.

**Invincible Puncture Proof Tire Co.**, 53 Sabin St., Providence. (Invincible.)

**National Motor Supply Co.**, 1911 Euclid Ave., Cleveland.

## POLISH.

**International Metal Polish Co.**, Quill St. and Belt R., Indianapolis, Ind. (Blue Ribbon.)

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.

## PRIMERS.

**Interstate Auto Accessory Co.**, Indianapolis. (Ideal.)

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Branches: See Horns.

**PUMPS, TIRE.**

Brown Co., Syracuse, N. Y. (Brown Impulse.)  
Dewey-Anderson Co., Toledo, O. (Dewey Power.)

**RADIATOR CONNECTORS.**

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

**RIMS—REMOVABLE AND DETACHABLE.**

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Firestone Tire & Rubber Co., Akron, O.  
Branches: In all principal cities.  
Standard Welding Co., Cleveland. (Stanweld.)  
United States Tire Co., Broadway and 58th St., New York. (Continental and Whittlesley Demountable.)  
Branches: New York, Chicago, San Francisco.

**ROAD BUILDING MATERIALS.**

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Branches: Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburg, Cincinnati, Kansas City, Minneapolis, New Orleans, Seattle, London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

**SHIELDS, MOTOR.**

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (Asbestos.)

**SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.**

Boyd, F. Shirley, 903 Boylston St., Boston.  
J. M. Shock Absorber Co., 210 So. 17th St., Philadelphia. (J. M.)  
Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)  
Sumner, George, Inc., 1926 Broadway, New York. (Velvet Auxiliary, Acme.)

**SOAPS.**

Hopewell Bros., Newton, Mass. (Paos.)  
Branch: 1974 Broadway, New York.

**SPARK PLUGS AND IGNITERS.**

American Ignition Co., 319 Adams St., Dorchester, Mass. (Amico.)  
Bosch Magneto Co., 223-225 W. 46th St., New York.  
Branches: See Magnetos and Magneto Supplies.  
Helms Electric Co., Lowell, Mass. (H. E. Co. Priming.)  
Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.  
Mosler, A. R., & Co., P. O. Box M, Mt. Vernon, N. Y. (Split Fire.)  
Randall-Falchney Co., Boston. (MacKae.)  
Branches: See Horns.

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Its efficiency is proved by scientific facts—not mere claims. Write for Ovington Data D. to 210 S. 17th Street, Philadelphia.

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The Completely Equipped Empire  
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Equipment includes Mohair Top and Top Envelope, Demountable Rims, Tire Irons, Extra Rim, Accelerator, Windshield, Prest-O-Lite Tank, Horn and Speedometer.

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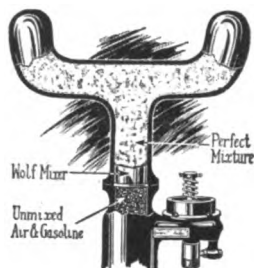
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Get more power and flexibility.  
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| Special Ford Type. ....  | 1.00   |

State make and model of car. Sent postpaid on receipt of price. Sold on two weeks' trial.

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**Approved Auto Specialties Co.**  
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Three Great Models. Pilot 40, four-cylinders, 41-2x5. Brake test, 53 horse power. 120-in. wheel base. Price, \$2000. Pilot 50, four-cylinders, 41-2x6. Brake test 59 horse power. 126-in. wheel base. Price, \$2250. Pilot 60, six-cylinders, 4x6. Brake test 67 horse power. 132-in. wheel base. Price, \$2500.

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Testor "T" Head Motors, full floating rear axles, Brown-Lipe differential, Warner transmission, Elsemann Magneto, Stromberg Carburetor, handsome jewel bodies with ventilating windshield. Completely equipped with every convenience and comfort. Dynamo electric lighting and electric starter (Gray & Davis system), power tire pump. We have the greatest agency proposition in the United States. Write for our beautiful art book showing cars in detail.

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Truck Springs

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| Five Passenger Touring Car, Fully Equipped | \$3000 |
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Branches: See Magnetos and Magneto Supplies.  
**Standard Co.**, The, Torrington, Conn. (Black Eagle.)

### SPARK PLUG TERMINALS.

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**Randall-Faichney Co.**, Boston. (Mac-Kae Blitz.)  
Branches: See Horns.

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**Interstate Auto Accessory Co.**, Indianapolis. (Ideal.)

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Branches: Broadway and 76th St., New York; 109 Massachusetts Ave., Boston; 1416 Vine St., Philadelphia; 1430 Michigan Ave., Chicago; 852 Main St., Buffalo; 253-255 Jefferson Ave., Detroit; 530 Golden Gate Ave., San Francisco; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.  
**Service Recorder Co.**, 2245 East 105th St., Cleveland. (Servis.)

**Stewart-Warner Speedometer Corp.**, Chicago. (Auto-Meter.)  
Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330½ North Illinois St., Indianapolis; 1613 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia; 5940 Kirkwood Ave., Pittsburg; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

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**Perfection Spring Co.**, No. 1 Plant, 2414 Superior Ave., N. W.; No. 2 Plant, East 65th and Central Ave., Cleveland.

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**Boyd, F. Shirley**, 903 Boylston St., Boston. (Baldwin.)

### STEEL PARTS, SEAMLESS.

**Standard Welding Co.**, Cleveland.

### STORAGE SYSTEMS—GASOLINE AND OIL.

**Sealfe & Sons Co.**, Wm. B., Pittsburg, Penn.  
Branch: New York City.

### TANKS, ACETYLENE GAS.

**Prest-O-Lite Company**, 271 East South St., Indianapolis. (Prest-O-Lite.)  
Branches: See Cylinder Cleaning Compound.

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**Sealfe & Sons, Wm. B.**, Pittsburg, Penn.  
Branch: New York City.

### TANKS, TIRE INFLATING.

**Prest-O-Lite Co.**, 271 East South St., Indianapolis. (Baby Tire Filler, The Emancipator.)  
Branches: See Cylinder Cleaning Compound.

(Continued on Next Page.)



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## TAPE—ASBESTOS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

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Dover Stamping & Mfg. Co., Cambridge, Mass.

## TIRE ACCESSORIES.

Firestone Tire & Rubber Co., Akron, O.  
Branches: See Rims—Removable and Detachable.  
Shaler Co., C. A., Waupun, Wis.

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Hopewell Brothers, Newton, Mass. (Hopewell.)  
Branch: 1974 Broadway, New York.

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## TIRE PRESERVATIVES AND PROTECTORS.

Approved Auto Specialties Co., 1731-37 Broadway, New York. (Goodman Tire Shield.)

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Braender Rubber & Tire Co., Rutherford, N. J. (Braender.)

Catacract Rubber Co., Wooster, O. (Catacract.)  
Branches: Boston, New York, Providence.  
Dayton Rubber Mfg. Co., Dayton, O. (Dayton Airless.)  
Diamond Rubber Co., Akron, O. (Diamond.)

Firestone Tire & Rubber Co., Akron, O. (Firestone.)  
Branches: See Rims—Removable and Detachable.

Fisk Rubber Co., Chicopee Falls, Mass. (Fisk.)  
Branches: 811-813 Boylston St., Boston; 17½ Dor-  
rance St., Providence.

Gaulois Tire Co., 1926 Broadway, New York. (Gaulois.)  
Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-Rim-Cut.)

Branches: In all principal cities.  
United States Tire Co., Broadway and 58th St., New York. (Continental, G & J, Hartford, Morgan & Wright.)

Branches: See Rims—Removable and Detachable.  
Walpole Tire & Rubber Co., Walpole, Mass. (Walpole.)

## TIRES—CUSHION.

Catacract Rubber Co., Wooster, O. (Catacract.)  
Branches: Boston, New York, Providence.  
Firestone Tire & Rubber Co., Akron, O. (Firestone.)  
Branches: See Rims—Removable and Detachable.  
Mots Tire & Rubber Co., The, Akron, O. (Electric Special Mots Cushion.)  
Branches: Boston, New York, Philadelphia, Pitts-  
burg, Chicago, Kansas City, Detroit, Cleveland, Los Angeles.

## TIRES—SOLID AND COMMERCIAL.

Firestone Tire & Rubber Co., Akron, O.  
Branches: See Rims—Removable and Detachable.  
Fisk Rubber Co., Chicopee Falls, Mass.  
Branches: See Tires—Casings and Inner Tubes.  
Goodrich Co., B. F., Akron, O. (Goodrich.)  
Mots Tire & Rubber Co., The, Akron, O. (Mots.)  
Branches: See Tires—Cushion.  
Polack Tyre and Rubber Co., 246 W. 59th St., New York City. (Polack.)  
Republic Rubber Co., Youngstown, O. (Republic.)  
United States Tire Co., Broadway and 58th St., New York.  
Branches: See Rims—Removable and Detachable.

## TOPS AND ATTACHMENTS.

Springfield Metal Body Co., 20 Medford Ave., Spring-  
field, Mass.

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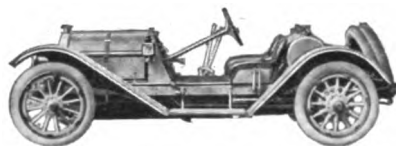
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Type 35  
Series J  
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Guaranteed  
Speed—Mile in  
51 Seconds



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The Mercer's speed and endurance record at Indianap-  
olis and other important contests is a valuable asset from  
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Some desirable territory open. Write today.

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## BRAENDER TIRES &amp; TUBES

Are of the highest quality and the cheapest on mileage. They are  
built to last. Send for price list and particulars.

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Heavy, Medium and Light

## Automobile Oils

27 STATE STREET, BOSTON, MASS.



## (BUYERS' GUIDE—Concluded.)

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Branch: 1974 Broadway, New York.

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**Wall, J. H.**, 290 Hope St., Bristol, R. I. (Ford.)

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Branches: See Cylinder Cleaning Compound.

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**McCue Co.**, The, Buffalo, N. Y. (Wire.)

**WIRE MECHANISM.**

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A STEADY SPARK  
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HECO MAGNETOS are the product of experts specialized in the electrical business. They embody all that the electrical industry knows about magnetos. By our special method of winding the secondaries we are able to positively guarantee them against burning out or breaking down. HECO MAGNETOS supply a spark of equal intensity for any number of revolutions per minute. We also make the well-known HECO COILS, and HECO COMBINATION PRIMERS and SPARK PLUGS. Let us send you our complete catalog.

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Sales Office, Detroit, Mich.



**Hoffeecker**  
"The Steady Hand"  
**Speedometer**

Accurate, durable—the one speedometer with a daily trip register that can be set at any mileage at any time.

**THE HOFFECKER COMPANY**  
Motor Mart—Main Offices—Boston, Mass. PRICES \$25 to \$135  
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Dorian Demountable Rims.  
Supplementary Spiral Springs. R. I. V. Ball Bearings.

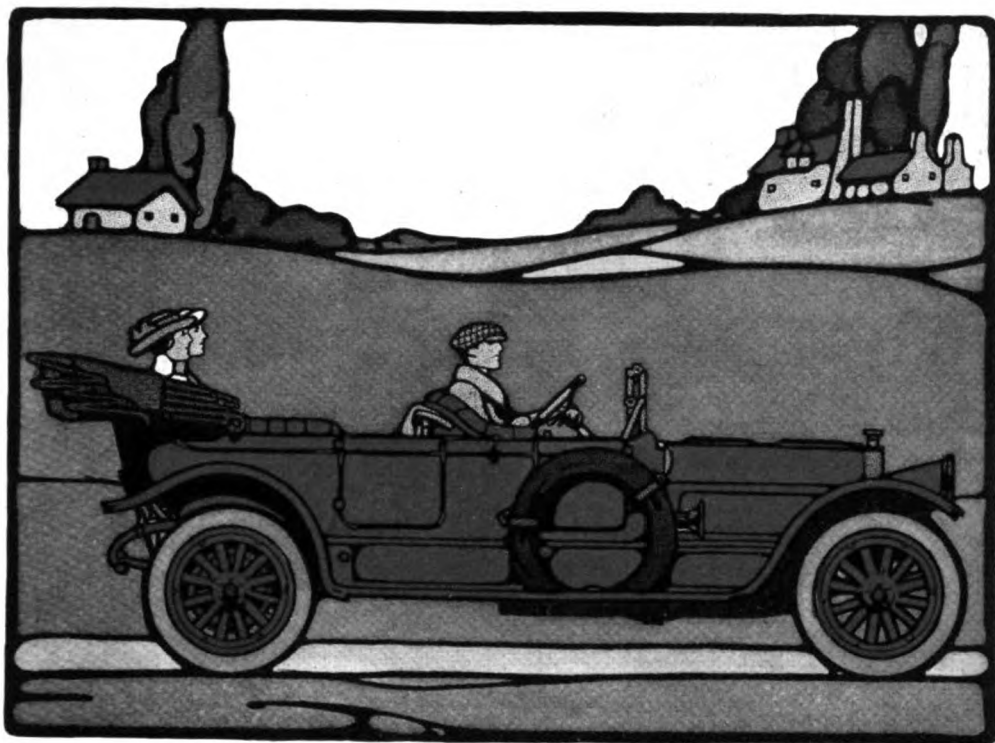
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All Up-To-Date Features  
Four cylinder, water cooled, 30 H. P. Four forward speeds. 112 in. wheelbase. Left hand drive, centre control. Starts from seat. Pointed hood, beautiful lines and finish. Equipment unsurpassed at the price.  
Write for full details and terms to agents  
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Bay State Autokit, No. 2, \$7.50  
Bay State Stickit, \$3  
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**NO** matter what you pay for an Automobile, unless you buy with it a service that lasts as long as the car lasts, you have not made a good investment. In each city where

## **THE PIERCE- ARROW CARS**

are sold there is a complete establishment for rendering those cars every attention they may need.

**The Pierce-Arrow Motor Car Co., Buffalo, New York**



# Why Raybestos is Imitated

Many Brake Linings have been put on the market during the last few years. Almost all have in some form or shape, tried to imitate

TRADE MARK  
**Raybestos**  
REG. U.S. PAT. OFF.

**"THE ORIGINAL AND BEST ASBESTOS BRAKE LINING"**

This is because **Raybestos** is the Standard Brake Lining of the Industry—the most durable, most reliable Lining that can be made.



Imitators have sought to profit by the reputation we have attained. BUT THE FACT STANDS OUT that while they can IMITATE **Raybestos**, they CANNOT EQUAL IT. It is made of genuine long-fibre asbestos, specially woven and treated, and is practically indestructible.

You need **Raybestos** lining on your brakes. When your car is overhauled, see that you get it. Make sure IT IS **Raybestos**. The name is stamped on every foot for your protection. It Made the Automobile Safe.

## **THE ROYAL EQUIPMENT COMPANY**

RAILROAD AND BOSTWICK AVENUES

BRIDGEPORT, CONN.

*We also make Duplex and Raymond Brakes and Gyrex the Mixer*

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VOL. XXXVI.

NO. 3.

# AUTOMOBILE JOURNAL

*\$1.00 the year*  
*10 cents the copy*

PAWTUCKET R.I.

September 10, 1913

Correct automobile lubrication is a serious problem. But its fundamentals are simple. We will cover them in plain question-and-answer form.

**Question:** What moves your car?

**Answer:** Power.

**Question:** What determines your power?

**Answer:** Your motor, your fuel and your lubricant. If any one of these factors falls short in full efficiency, you receive less than full power. The greater part of the power lost is taken up by friction—wear on the moving parts.

**Question:** What will give you the most efficient lubrication?

**Answer:** An oil of the highest lubricating qualities whose "body," or thickness, is best suited to the feed requirements of your motor.

**Question:** Suppose you use oil of lower lubricating quality or of less correct "body". What are the penalties?

**Answer:** Many. Among them are:

(1) Escape of the explosion past the piston rings. (2) Unlubricated cylinder walls at the upper end of the piston stroke. (3) Imperfect lubrication of many of the bearings. (4) Excess carbon deposit. (Due to the oil working too freely past the piston rings and burning in the combustion chamber.) (5) Excessive oil and fuel consumption. (6) Worn wrist pins. (7) Rapid and unne-

cessary deterioration of your motor. (8) Loose bearings. (9) Noisy operation.

**Question:** How can you determine the correct oil for your car?

**Answer:** By consulting our lubricating chart which will be mailed you on request.

**Question:** What assures the reliability of this chart?

**Answer:** The chart is the result of the most far-reaching and most thorough study of automobile lubrication that has ever been undertaken.

It was prepared by a Company whose authority on scientific lubrication is recognized throughout the world—the Vacuum Oil Company.

It was prepared after a careful analysis of the motor of each make and each model of American and foreign car.

The superior efficiency of the oils specified has been thoroughly proven by practical tests.

*If you use oil of lower lubricating quality or of less-correct "body," than that specified for your car, your motor faces unnecessary friction, loss of power, and ultimate serious damage.*

A booklet, containing our complete lubricating chart, together with points on lubrication, will be mailed on request.



## Mobiloil

**A grade for each type of motor.**

The various grades, refined and filtered to remove free carbon, are: Gargoyle Mobiloil "A", Gargoyle Mobiloil "B", Gargoyle Mobiloil "D", Gargoyle Mobiloil "E", Gargoyle Mobiloil "Arctic".

They are put up in 1 and 5 gallon *sealed cans*, in half-barrels and barrels. *All are branded with the Gargoyle, which is our mark of manufacture.* They can be secured from all reliable garages, automobile supply stores, and others who supply lubricants.

VACUUM OIL COMPANY, Rochester, U. S. A.

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CHICAGO  
Fisher Bldg.

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INDIANAPOLIS  
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MINNEAPOLIS  
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Important Event of  
the Season



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Chas. E. Miller's Annual Catalog has come to be universally recognized as the standard dictionary of the American automobile accessory and supply industry. It is more than a business aid. It is a reference work which is used by thousands for this purpose every day in the year.

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Send your name and address *now* with 5 cents postage (to cover cost of mailing) for a free copy of this valuable book.

**CHAS. E. MILLER,** Manufacturer, Jobber, Exporter and Importer, **97-99-101-103 Reade St., New York City**

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ELECTRIC SYSTEMS ONLY 25 PERCENT EFFICIENT

ACETYLENE GAS LIGHTING BALLOON

ELECTRIC GENERATORS MAKE TOO MUCH CURRENT HAVE TO BURN LAMPS IN DAY TIME TO USE IT UP


MAKES THE CAR WEIGH 1500 LBS. MORE

HELP!

LIGHT OF THE FUTURE GAS TURNED ON FROM THE DRIVERS SEAT

**ELECTRIC LIGHTS WONT DO.**

**ABOVE IS WHAT THE GAS MAN SAYS**

**EVEN WITH THIS AWFUL HANDICAP WE HAVE CONTRACTS FOR  STORAGE BATTERIES FOR OVER 200,000 CARS**

**THE WILLARD STORAGE BATTERY COMPANY CLEVELAND, OHIO.**

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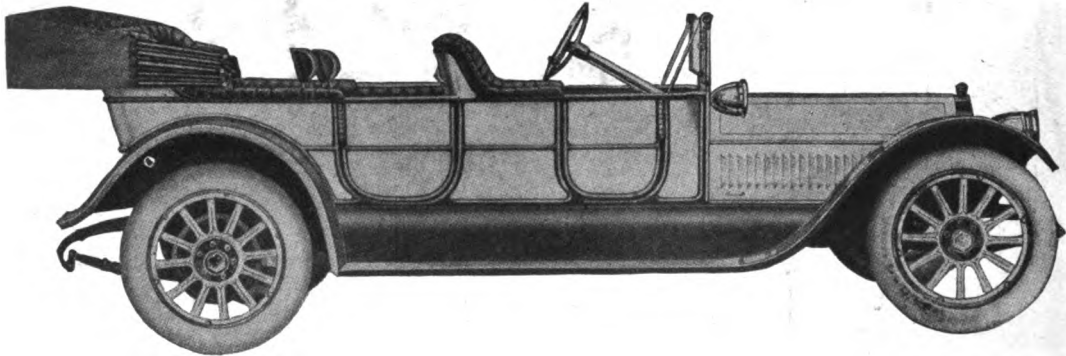
## Our Exclusive Feature

We will (at small extra cost) furnish  
our Regular Models with the



# AUSTIN Two-Speed Axle

This axle provides two different gear ratios, both on direct drive, and in combination with a three-speed transmission gives six speeds forward and two reverse.



Model "77" has a Regular Direct Drive of 3 1-2 to 1, and a Special Direct Drive of 2 to 1.  
Model "55" has a Regular Direct Drive of 4 1-2 to 1, and a Special Direct Drive of 3 to 1.

The Regular Direct Drive provides ample power and exceptional ease of control for hills, bad roads and crowded city traffic.

The Special Direct Drive for normal conditions, shows a gain of over 50% in mileage for the same fuel consumption and motor speed, eliminates the noise, wear and tear of running the motor at excessive speeds, adds materially to the life and durability of the car and pleasure of riding.

|   |   |   |           |
|---|---|---|-----------|
| Model "77" Six Cylinders, 4 1-2 x 17    | - | - | \$6000.00 |
| Model "66" Six Cylinders, 4 1-2 x 5 1-2 | - | - | \$5000.00 |
| Model "55" Six Cylinders, 4 x 5         | - | - | \$4000.00 |

**MORE NEW, IMPROVED and DISTINCTIVE FEATURES** than any other car. Two-speed rear axle, high pressure air self-starting system, complete electric lighting system, left hand steer, center control, two-spark magneto, four-speed transmission, both brakes controlled by foot pedals.

*Write for complete description and any information you may desire in regard to our two-speed axle.*

# Austin Automobile Company

GRAND RAPIDS, MICHIGAN





# STOP

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Imagine  
a  
plug  
that  
will  
last  
forever



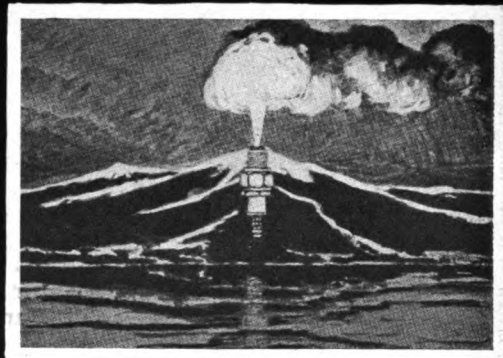
# WATCH

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Mosler

# Vesuvius

Plug



AS POWERFUL AND AS  
INDESTRUCTIBLE AS THE  
FIRES OF VESUVIUS

WE CARRY IN STOCK  
A PLUG FOR EVERY  
Internal Combustion Engine Built

**A. R. MOSLER & CO.**  
P. O. Box "M," MT. VERNON, N. Y.





## Handle the Haynes and auto buyers hunt you up

Few people will buy cars the coming year without seeing the Haynes—America's First Car—with its year-ahead features, including the Electric Gear Shift

Usual customs and circumstances are being reversed this year among Haynes dealers. They have no problem of "scaring up prospective buyers"—whom they may develop through much talking and demonstrating, into buyers, and more often may not.

Prospective automobile buyers are hunting up the Haynes dealer, to see the car they have heard so much about—they are eager to see the Electric Gear Shift and try it for themselves.

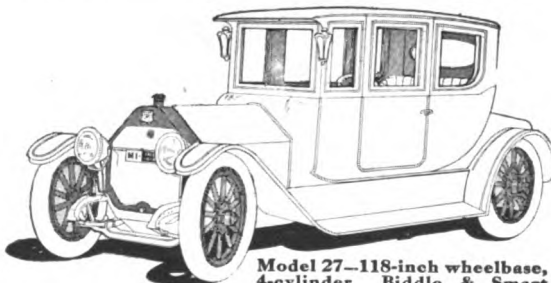
## The Electric Gear Shift

draws prospective buyers in crowds to see the

# HAYNES

*America's First Car*

They are as eager to see the Electric Gear Shift and try it for themselves as our dealers are to show them. Everybody has heard about the wonderful Electric Gear Shift. Wonderful is the only name strong enough to fit the device by which the gear lever is entirely superceded—relegated to the tool box—while the shifting of gears is accomplished in the simple, easy way of pressing push buttons, conveniently located on the steering wheel.



Model 27—118-inch wheelbase, 4-cylinder. Biddle & Smart coupe body. Price, \$2700.



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Everything that adds comfort, convenience and service, is standard equipment in the Haynes.



### Specifications of the New Haynes

**Motor**—Bore 4 1-4 in., Stroke 5 1-2 in. L-head Haynes. Cylinders cast in pairs. Model 26, A.L.A.M., 48.35 H. P., Dynamometer 65 H. P. Model 27, A.L.A.M., 48.35 H. P., Dynamometer 65 H. P. Model 28, A.L.A.M., 29.9 H. P., Dynamometer 48 H. P.

**Weight**—Model 26, 3800 lbs., Model 27, 4000 lbs., Model 28, 3400 lbs.

**Cooling**—Centrifugal pump and pressed steel fan.

**Wheel Base**—Model 26, 130. Model 27, 136. Model 28, 118.

**Ignition**—American Simms' Magneto.

**Carburetor**—Stromberg.

**Lubrication**—Splash and gravity feed.

**Control**—Left hand. Vulcan Electric Gear Shift.

**Transmission**—Selective Type, three speeds forward, one reverse.

**Steering Column**—Worm and worm gear type.

**Clutch**—Haynes contracting steel band.

**Rear Axle**—Full Floating Timken on Models 26 and 27; McCue, Model 28, Gourney Bearings.

**Front Axle**—I-Beam. O. H. steel heat treated.

Hand lever shift optional at \$200 reduction.

**Wheels**—Artillery type. Funk demountable rims.

**Tires**—Models 26 and 27, 36x4 1-2. Model 28, 34x4.

**Springs**—Front Semi-elliptic 39 1/2x2, rear 48x2.

**Brakes**—15 1-4 external and 15 internal Models 26 and 27. 12 and 16 internal on Model 28.

**Finish**—Indiana dark blue body. Pacific Tour gray, optional.

**Gasoline Feed**—Pressure, Automatic feed.

**Upholstery**—Buffed leather. Deep cushions.

**Starting and Lighting**—Leece-Neville electrical system.

**Cowl-board Equipment**—Electric lights, sight oil feed, automatic cut-out for generator, dash light, auxiliary air pressure pump, air gauge and speedometer. Models 26 and 27 have rim wind clock.

**Other Standard Equipment**—Top, top cover of silk mohair, mechanical tire pump, rain vision ventilating wind-shield, Vulcan Electric Gear Shift, two large electric head lights, electric side lights, electric tail light, full dash equipment, electric starter, generator, 12 volt, 80 ampere hour storage battery, speedometer, horn, coat and foot rails, tire irons, full tool equipment, one extra demountable rim and Collins curtains. Models 26 and 27 have Truffault-Hartford shock absorbers.

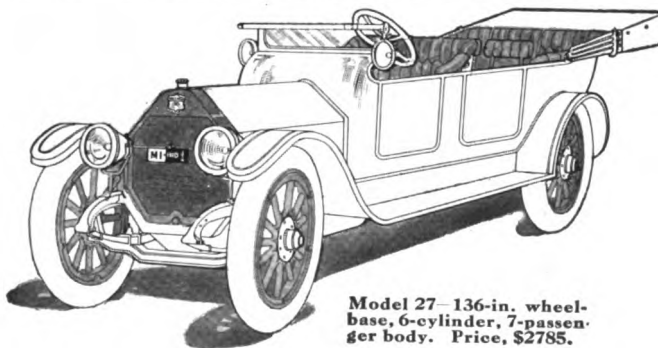
# HAYNES

## cars literally sell themselves

They draw large numbers of prospects to the salesrooms of our dealers. We are, also directing to our dealers, dozens of people who have taken the trouble to write us for our nearest dealer's name.

Once a prospect starts investigating the Haynes, he cannot be satisfied with any other car. The pride of owning the Haynes, America's First Car, its reputation for power, speed and reliability, coupled with everything in the way of up-to-date equipment—including electric starting, lighting and the Vulcan Electric Gear Shift—makes the Haynes the most sought-after car on the market.

### The Haynes Automobile Co., 6 Main St., Kokomo, Indiana



Model 27—136-in. wheel-base, 6-cylinder, 7-passenger body. Price, \$2785.



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# COES

## THE Wrench Supreme

Strength without bulk or clumsiness.

Ease of handling without slipping or bruising.

Perfect balance and right grip

Everything the motorist desires in a wrench is to be found in the "COES" AUTOMOBILE MODEL, and you will never know perfect wrench service until you pin your faith to it.

It stands to reason that the 5 per cent. more you pay for a "COES" wrench goes for 60 per cent. more quality and service—put this wrench in the tool kit and shop. You will get your money's worth.

Send for Literature Now.

---

### Coes Wrench Co.

WORCESTER, MASS.

J. C. McCARTY & CO.,  
21 Murray St., New York City

JOHN H. GRAHAM & CO.,  
113 Chambers St., New York City

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# 60 "SIX" KISSELKAR 60 "SIX"

**The Big Car that Pioneered Downward Prices Maintains Its Leadership as a Car of Unsurpassed Ability, Elegance and Comfort.**

Point for point this powerful, silent, thoroughbred KisselKar 60-"Six" challenges critical comparison. Its symmetry of design, perfect poise and balance, and long, clean, graceful lines appeal irresistibly to your sense of beauty and fitness.

At first sight you feel instinctively that this big KisselKar "Six" is a car that you would be proud to own. Your first road test will disclose the exceptional riding qualities of this "greyhound of the highways." Gliding smoothly along in this superb car of comfort, you realize the utmost limit of motoring delight.

The exceptionally liberal 142-inch wheelbase, the big wheels and over-size tires, shock absorbers and eleven inches

of seat upholstery reduce road vibration to the minimum. And the unusually spacious tonneau and deep pitched seats permit you to recline at ease, unaffected by the "lurches" and sidesway incident to ordinary motoring.

The lighting facilities are strikingly original, especially the illuminated instrument board and special lights that sweep the full length of the running boards, and the "bull's-eye" in the tail lamp, the rays of which directly reach the gasoline gauge. The Golde patent "one man" top, Warner speedometer, Klaxon horn and many other features of the highest priced cars are all found in the KisselKar 60-"Six" equipment.

The KisselKar 60-"Six" at \$3150 is a wonderful value that easily

leads the "big Six" field. Price of the new KisselKar 48-"Six" is \$2350; KisselKar 40-"Four," \$1850. All KisselKars are fully equipped, and are electric lighted and started. They have left hand drive and center control.

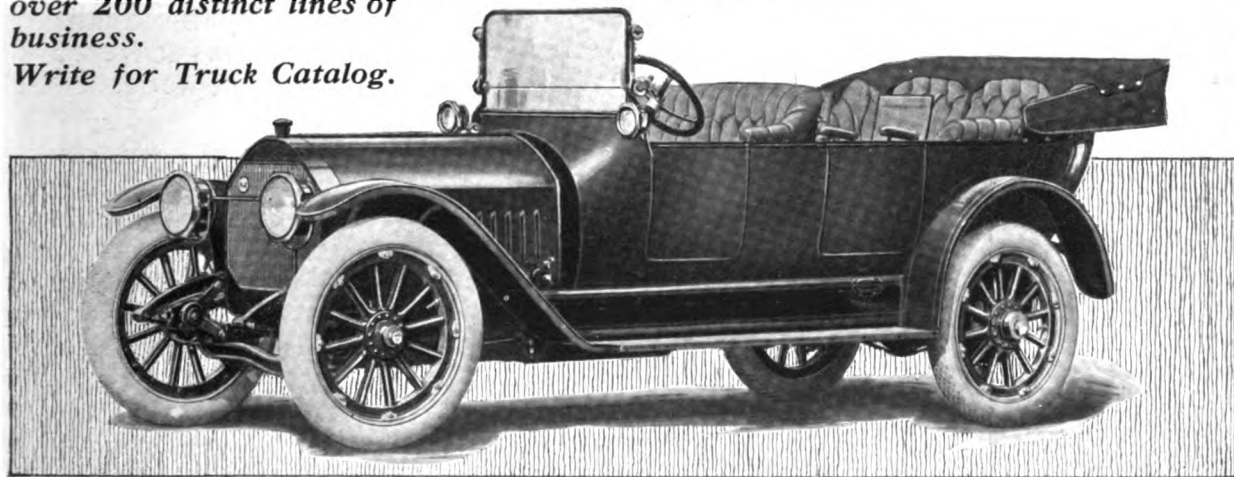
## KisselKar Service Contract

The KisselKar is sold under a written guarantee of service to owners—a tangible, definite and specific contract that clearly stipulates the scope of KisselKar Service and provides mechanical care that forestalls trouble and retards depreciation.

**KisselKar Trucks—1500 lbs. to 6 tons—are used in over 200 distinct lines of business.**

**Write for Truck Catalog.**

These new KisselKar Models are now being shown by our representatives everywhere. See your nearest Dealer for demonstration, or write us for complete catalog.



**KISSEL MOTOR CAR CO., 174 Kissel Ave., Hartford, Wis.**

BOSTON NEW YORK CHICAGO MILWAUKEE KANSAS CITY MINNEAPOLIS ST. PAUL  
DALLAS SAN FRANCISCO LOS ANGELES OAKLAND

Philadelphia, Detroit, Houston, El Paso, New Orleans, Washington, Baltimore, Nashville, Duluth, Buffalo, Pittsburgh, Hartford, Conn., New Haven, Albany, Troy, Rochester, Providence, Montreal, Quebec, Toronto, Winnipeg, Calgary, and 300 other principal points throughout America.

**When Writing to Advertisers, Please Mention The Automobile Journal.**



# INVADER OIL



## A PURE OIL

The railroads do not buy their oil by the gallon—they buy it by the mile. The reason is obvious.

The automobilist is apt to think that the selection of a cheap oil is simple. It is the reverse. It is complex.

Into the matter enter such questions as the relation between miles travelled and gallons consumed, and the relation between cost of up-keep and cost per gallon per mile.

Although many different brands of oil are being called to your attention by extravagantly worded advertisements, it is a well-known fact that the scarcity and increased cost of Pennsylvania Crude has lowered the gravity and consequently the quality of lubricating oil, just as it has lowered the gravity and quality of gasoline. This parallel is exact.

Invader Oil is one of the few high gravity, one hundred per cent. Pennsylvania Oils now being marketed and its use will prolong the life and efficiency of any gasoline motor. It is the cheapest because it is the most efficient. It costs less in dollars and cents per thousand miles than any other oil made.



1 GALLON CAN

# INVADER OIL

(LESSEES OF CHAS.

Main Office—76 Broad Street

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TERRITOR

Boston: 284 Columbus Ave.

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Motor Car Supply Co.....Chicago, Ill.  
Beck & Corbitt Iron Co.....St. Louis, Mo.

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# i-o-c GEAR OIL

## A NOISELESS OIL

I-O-C Gear Oil is the only oil ever made especially and exclusively for the lubrication of automobile transmission gears.

It is absolutely different from any other oil made and possesses certain peculiar properties that cause it to face the gear teeth with a coating that is practically indestructible and prevents wear and reduces noise and friction to a minimum.

It contains no foreign matter such as ground cork, sawdust, etc., but is 100 per cent. OIL, and being free from water and chemicals it will not foam in the case when running or allow the bearings to rust when idle.

Remember, it is only the OIL, which a grease contains that has any lubricating value. I-O-C Gear Oil is not only all oil, but it's the only oil that will eliminate the hum or grind of metal gears.

### A 10 Lb. Can Costs \$1.50

A trial will convince the most skeptical that I-O-C Gear Oil is better than any grease, any dope, any compound, or any other form of gear lubricant ever put on the market.

# L COMPANY

F. KELLUM & CO.)

Factories—New York and Philadelphia

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The Lee Hardware Co. .... Salina, Kans.  
American Lubricating and Supply Co. .... Kansas City, Mo.  
James Bailey Company ..... Portland, Me.

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10 LB. CAN





Compared with the millions of people who ride in motor cars, the number of those who sustain accidents from this mode of travel is a very small percentage. A certain percentage of accidents is inevitable, but it is so small that the most pessimistic person alive does not think for a moment that motor cars as they are built today are unsafe.

But if there is a single stone left unturned to minimize the percentage of accidents, every manufacturer will, sooner or later, make the necessary refinements in his cars. The refinement we point to is the replacement of wooden wheels by steel wire wheels.

Possibly the most likely illustration of this point is found in the way railway companies have developed their trains from the wooden passenger cars to "all-steel" passenger coaches and Pullmans in order to get SAFETY FIRST, with comparatively greater speed and comfort.

We hardly ever think of safety without it bringing to our minds the closely related thought of strength—strength to provide safety.

In every test engineers could conceive that would allow them to arrive at the relative strength of wire and wooden wheels, wire wheels have shown a uniform superiority both as to carrying strength and as to their ability to resist side thrust. The figures which give the best idea of relative strength show that Wire Wheels have a carrying strength from five to seven times as great as wooden wheels, and that their strength to resist side thrust (such as skidding into the curb would be) is nearly 15 times that of wooden wheels.

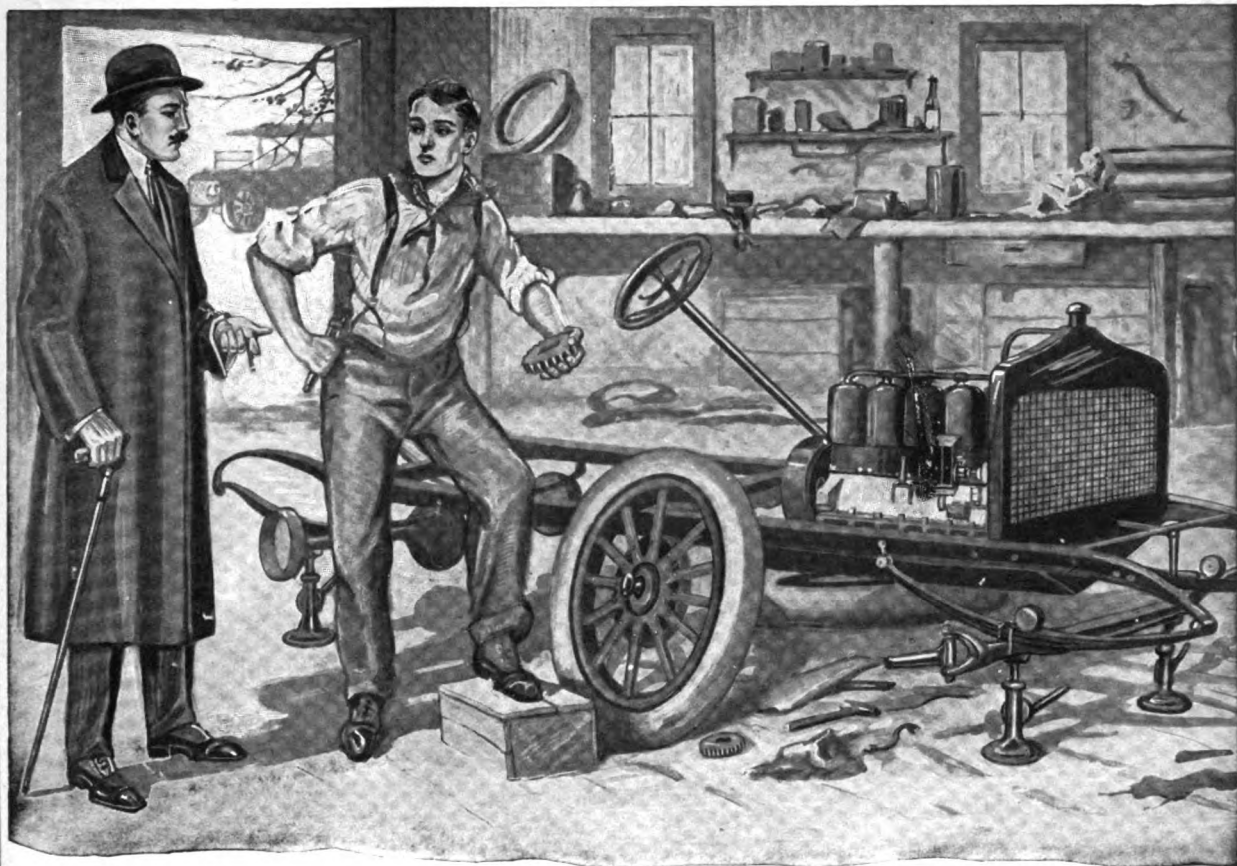
These tests gave engineers certain data to go upon and the next step taken was to keep the performance of various wire wheel equipped cars under constant observation as they went about in every day use. Invariably wire wheels have lived up to the reputation gained under test.

In the recent Grand Prix Race at Amlens a wire wheel equipped car collided with an embankment and turned completely over. Because one of its rear tires was ripped it was necessary to change a wheel, but the front wheel, which sustained a far heavier blow, was left on and the car continued in the race after having been righted.

So much evidence of their superior strength could be piled up that all question of safety is answered far better by wire wheel equipment than with wooden wheels. It is part of a decided movement which has characterized means of travel toward all-metal construction. Note the increasing number of American made cars which are showing their new models equipped with wire wheels; the movement is almost universal.







## When the Repair man performs the Autopsy

he finds, nine times out of ten, that *poor lubrication* has caused all the costly havoc. Then he asks the simple question,



"Why don't you use

TRADE MARK  
**NON-FLUID OIL** ?"  
REGISTERED IN  
PATENT OFFICE  
UNITED STATES



and he tells in his honest way what he, as a mechanic, knows about the depredations of cheap lubricants.

## Why don't you use **NON-FLUID OIL**?

Get the genuine in orange colored cans.

### New York & New Jersey Lubricant Co.,

165 Broadway, New York

Chicago, 1430 Michigan Ave.

Philadelphia, 1431 Vine St.

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# Overland

1 9 1 4

**T**HE 1914 Overland is ready for demonstration and delivery. See full description on *opposite* page. Our production for next year has been *increased* to 50,000 cars. This greatly increased production, combined with the natural manufacturing economy of restricting ourselves to *one chassis*, again enables us to make our customary annual offer of *considerably* more car for *considerably* less money.

While the price has gone *down* the value has *gone up*. The motor is *larger*; the wheelbase is *longer*; the tires are *larger*; the tonneau is *roomier*; the equipment is *better*—including such costly additions as *electric lights*; the body is *more handsomely finished*, in rich dark Brewster green, with heavy nickel and aluminum trimmings. In fact, in every single and individual respect it is an *improved* car at a *reduced* price.

We already have applications on file for *more* cars than we could deliver during the month of August. Therefore, it is advisable for you to see the nearest Overland dealer *promptly*, in order to secure an *immediate* delivery.

1914 catalogue on request.

*Please address Dept. 52*

## The Willys-Overland Co., Toledo, Ohio



# \$950

## Overland Model 79

35 horsepower  
114-inch wheelbase  
Electric head, side, dash and  
tail lights  
Timken bearings  
New Splidort magneto

Model R Schebler carburetor  
Three-quarter floating rear axle  
33x4 inch Q. D. tires  
Cowl dash  
Turkish upholstery  
Genuine, hand buffed leather

Clear-vision windshield  
Mohair top, curtains and boot  
Stewart speedometer  
Electric horn  
Flush U doors with disappearing hinges

**MOTOR**—Four cylinders, cast singly and set off center. Bore 4-1/8 inches, stroke 4-1/2 inches. Five bearing crankshaft; three bearing camshaft. Improved type of pushrods and guides, adjustable and easily removable.

**COOLING**—Thermo-syphon, or natural water system, without pump. Radiator has large tubes and all water pipes and connections are extra large, insuring perfect cooling.

**FRAME**—Pressed steel channel section reinforced with angle irons and cross members, hot-riveted.

**CLUTCH**—Leather-faced cone, with new type brake to permit noiseless gear changing.

**TRANSMISSION**—Selective, sliding gear type, with three speeds forward and reverse. Center control. Gear case, extra strong, cast in one piece, keeps all bearings in line. Main and countershafts are short, preventing any springing.

**LUBRICATION**—Splash system, pump circulated, with sight feed on dash.

**BRAKES**—Double, contracting and expanding on drums on rear-wheel hubs, easily ad-

justable. Either set of brakes will keep car under perfect control at any speed, with full load.

**SPRINGS**—Semi-elliptic front, three-quarter elliptic rear, with bronze eye bushings all around and compression grease cups on all bolts.

**STEERING GEAR**—Worm and gear type, easily adjustable and anchored to side frame member. Column of large diameter. Wheel 18 inches in diameter.

**FRONT AXLE**—I-beam section, drop-forged in one heat, without welding. Timken bearings in front wheel hubs.

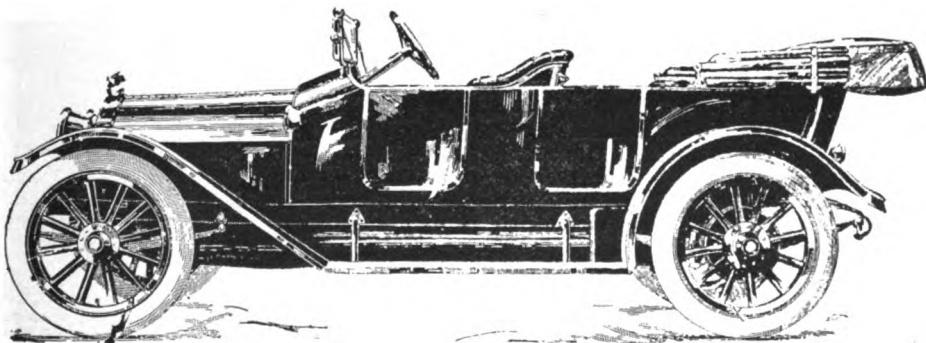
**REAR AXLE**—Three-quarter floating type. None of the weight of the car on the driving shafts. Hyatt bearings in rear wheel hubs.

**WHEELS**—Hickory, artillery pattern, with twelve spokes, and bolts in each.

**BODY-FINISH**—Brewster green, with light green striping. All exposed metal finished in nickel or aluminum.

**BODY**—Five passenger; metal reinforced with wood framing.

*Completely Equipped \$950. With Gray & Davis Electric Starter and Generator—\$1075 f. o. b. Toledo.*



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**FORD DELIVERY BODIES**, in stock and ready to attach. "LEW" FALES, Providence, R. I.

**EVERY CAR OWNER SHOULD USE ELECTRIC POLISHING CLOTHS.** Keep the new car from looking old and shabby and make the old car look like new. No. 1 cloth removes all spots and stains. No. 2 cloth gives a hard dry polish that will not gather dust. Saves half the time in washing. Price 50 cents a set by Parcel Post. Order now. A. & R. Co., Wallingford, Conn.

IMITATED

BUT NOT

DUPLICATED

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THE OIL THAT SUITS  
AND DOES NOT SOOT.

Carbon in your cylinders means loss of power. Customers report 10,000 to 15,000 miles with no carbon troubles. A good motto: TRY ANYTHING. ONCE. EAGLEINE NO-CARBON AUTO OIL is furnished in 1-5-10 gallon, 30 and 50 gallon Steel Drums with faucets for which no extra charge is made.

EAGLE OIL  
AND SUPPLY CO.

104 BROAD STREET, BOSTON, MASS.



# Elgin National Race

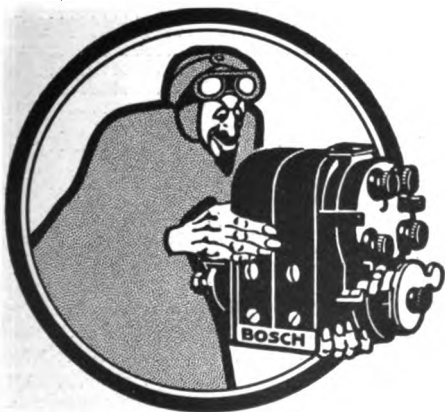
## Another Bosch Victory

### —Of Course—

A rigorous test again is given Bosch Magnetos and Plugs and again they prove their superiority over all. ∴ ∴ ∴

**1st Stutz —Bosch Magneto and Plugs**  
**2nd Mason—Bosch Magneto and Plugs**  
**3rd Mercer—Bosch Magneto and Plugs**

Not only did Bosch make its usual clean sweep but the Stutz broke the record for the course and the Mercer for the lap.



There is more vim, vigor and snap in Bosch Ignition than possibly can be obtained otherwise.

**Be Quite Positive YOUR  
Engine Is Bosch-Equipped**

**Bosch Magneto Company**  
**204 West 46th Street New York**

Maine Motor Car Co., Portland, Me.—Motor Parts Co., Boston—  
 N. E. Distributors.





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## CLEAR PROOF OF THE HIGH QUALITY AND POPULARITY OF MULTIBESTOS BRAKE LINING

is found in the fact that the large and increasing demands for it have forced us to extend our facilities of production and build a new factory. Our two plants at Worcester have been vacated and we are now to be found in our new home at

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We hope that our friends will note this change of address for we count the loyalty of a wide circle of friends as our one best asset. It is relying upon a continuance of this loyalty, together with the hope of making many new friends, that we build our hopes of a busy future with many chances to serve—and serve with satisfaction.

One thing we promise—that the same features which have made Multibestos the standard of quality in brake linings in

the past will be maintained and preserved in our future production, and that there will be no change in specifications or basic materials. In our other departments too, provision has been made for an increased production so that we can turn out a full line of woven fabrics for mechanical purposes. We are particularly equipped for the manufacture of clutch linings and friction facings in special forms and sizes and treated in a way to adapt them for any conditions of service.

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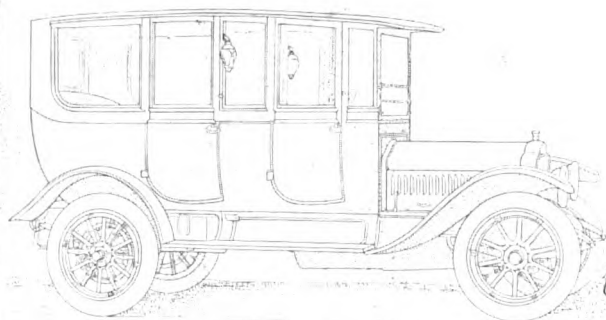




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For its absolute correctness of construction, for the perfect control and noiselessness of its power, for its inspiring dignity of appearance, and for the studied attention to every smallest detail that provides complete comfort and relaxation, the White Berline stands unequalled.

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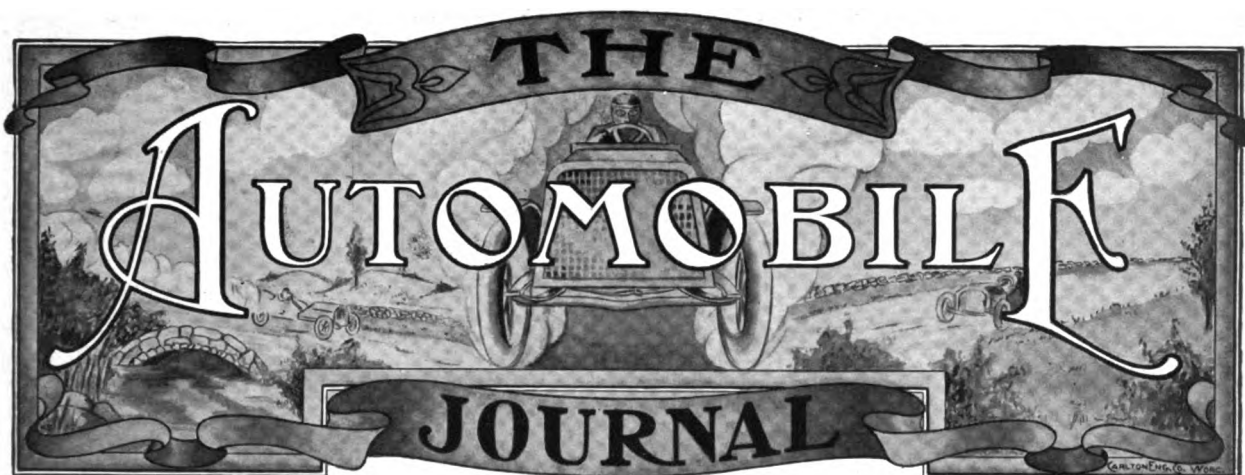
*Venus persuades Apollo to abandon his sun chariot for the White Berline.*



- Otto Cushing

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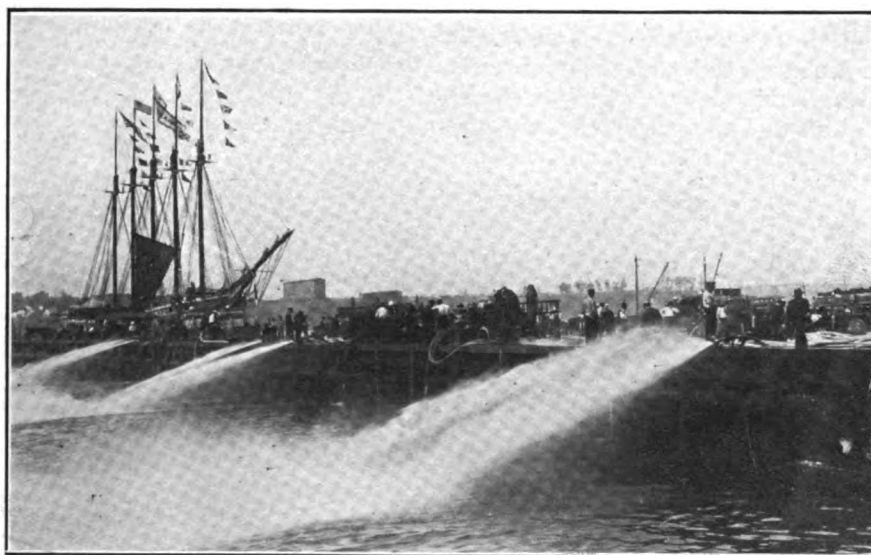
## NEW ERA IN FIRE-FIGHTING METHODS.

**Remarkable Impartial Test of Motor Pumping Engines Conducted by National Board of Fire Underwriters in Connection with Forty-First Annual Convention of International Association of Fire Engineers in New York City.**

**A**PPARENTLY the 41st annual convention of the International Association of Fire Engineers, which opened in the Grand Central Palace, New York City, Sept. 1, and came to an end late Saturday night, Sept. 6, marked the beginning of a horseless era in the fire department. In the exposition of fire apparatus, which has been an interesting feature of nearly every convention of the organization, there was

untermers were still very much in evidence, and the prancing fire horse was not yet a generally accepted emblem of the service. Thus the International Association of Fire Engineers has witnessed the

rise and fall of the horse as a necessary factor in fire fighting. The superior possibilities of the motor driven apparatus are now acknowledged, and while there may still be some remnant of distrust concerning the gasoline pumping engine, the ex-



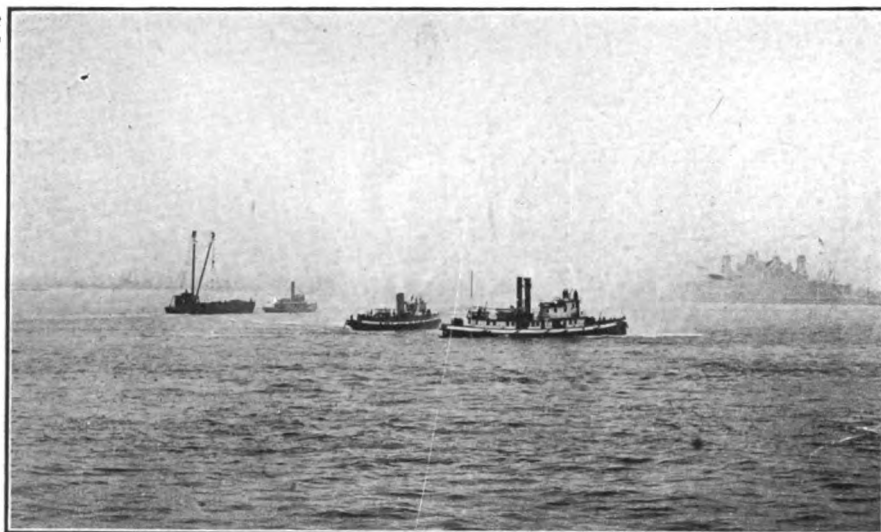
General View of the Pier at West 54th Street, New York City, During the 12-Hour Test of Motor Pumping Engines.

not a single piece designed to be drawn by horses.

The first convention was held in New York City in 1873, when the red shirts of the old vol-

hibits this year demonstrated that the automobile industry is prepared to meet every objection at this point by supplying tract-





**Demonstration of Fire Boats Off Battery Park for Benefit of Visiting Firemen.**

ors capable of hauling the old steamer wherever needed. And the gasoline pumping engines did their full share to convince the assembled firemen of their ability to cope with the situation.

It is estimated that something over 1200 fire chiefs, commissioners and men of various rank were present when President H. F. Magee, chief of the department in Dallas, Tex., called the convention to order. President Magee first introduced Chief John Kenlon of the New York department, who in turn presented Fire Commissioner Joseph Johnson, who delivered the address of welcome in the absence of Mayor William Gaynor on account of illness. The reply was made by Charles H. Henderson, chief of the department in Bradford, Penn. Immediately after these addresses honorary membership was conferred upon Chief M. J. Meier of Amsterdam, Holland; Divisional Chief Arthur R. Dyer of London, England, and Major E. T. Walker, in charge of the fire department in Alexandria, Egypt.

Throughout the week various activities of more or less direct interest to the association as such were held, these including the unveiling of a monument to the memory of those who had given their lives in the performance of duty at fires, in connection with which

many members of the association and veteran firemen of New York City and many nearby cities took part in a street parade. A portion of another day was taken up with a demonstration of 10 fire boats off Battery park, and a trip to Coney Island. These features of the programme were not permitted to interfere in any manner with a close inspection of the machines on display in Grand Central Palace, certain portions of each day being set aside for this particular purpose. The list of exhibitors included the

following and their products:

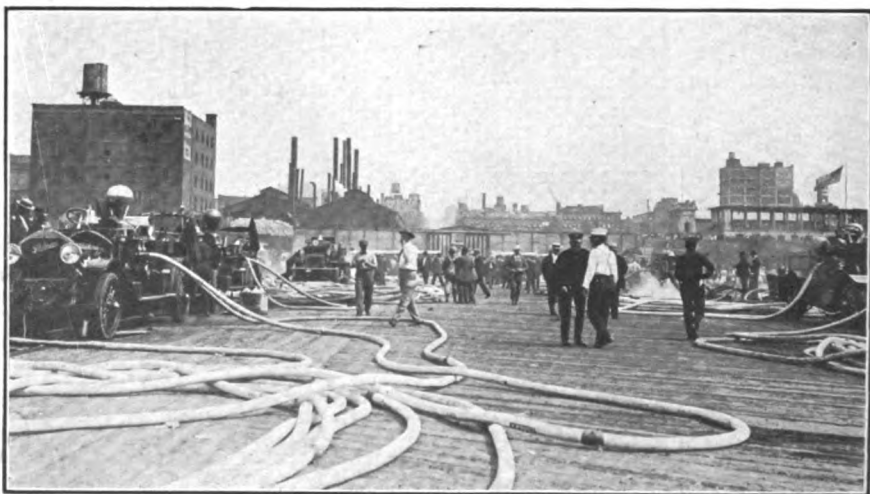
American & British Manufacturing Company, Providence, R. I.—Gasoline-electric driven steam fire pump and demonstrator of the same type on the street.

James Boyd & Bro., Philadelphia, Penn.—Combination hose and chemical on White chassis, and four-cylinder, 60 horsepower combination hose and chemical, with squad body and Kanawaha system of chemical discharge.

American-La France Fire Engine Company, Elmira, N. Y.—Two 75-foot aerial ladders and tractor, 65-foot aerial ladder and tractor, type 15 pumping engine, type 10 combination, type 12 triple combination fire engine and tractor, type 14 city service machine, two small chemicals, fire engine and tractor. Also Niagara No. 1 self-propelled steam engine, first to be made in America, rebuilt by this company for New London, Conn., in 1912.

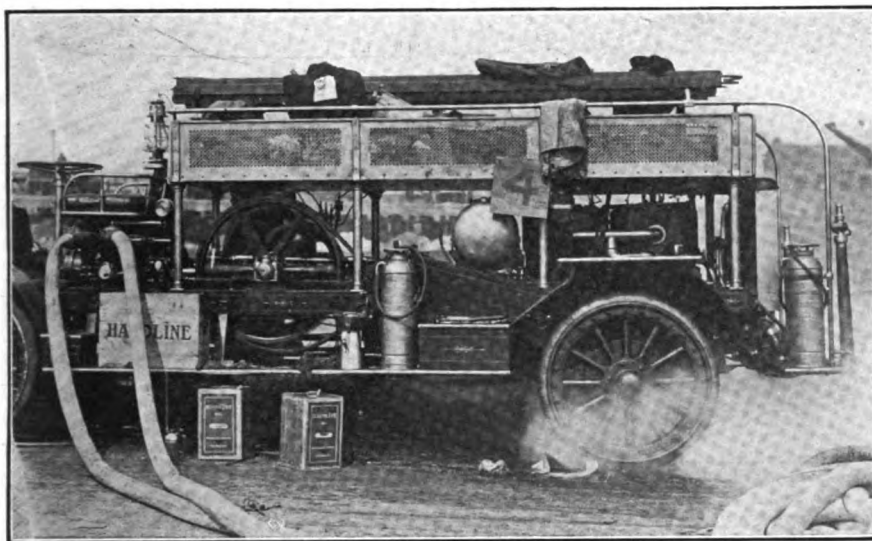
Knox Automobile Company, Springfield, Mass.—Three pumping engines, triple combination hose and chemical, piston pump, single tractor and tractor and converted steam engine from department in Springfield, Mass. Also as demonstrators steamer and 75-foot aerial ladder with tractor.

Seagrave Company, Columbus, O.—Six-cylinder, 146 horsepower pumping engine of 1000-gallon capacity; four-cylinder, 53 horsepower chemical and hose wagon; 75-foot aerial ladder truck and six-cylinder, 80 horse-



**Looking Down the Pier While Pumping Test Was Being Conducted.**





**Luitwieler Machine, with Engine and Radiator at the Rear and Pump in Front.**

power tractor; six-cylinder, 80 horsepower city service wagon.

International Motor Company, New York City—Mack tractor and converted horse ladder truck, hose wagon with turret nozzle for New York City department, hose wagon and combination hose and chemical.

Pope Manufacturing Company, Hartford, Conn.—Shaft driven combination hose and chemical, and chain driven combination hose and chemical.

Robinson Fire Apparatus Manufacturing Company, St. Louis, Mo.—Four-cylinder pump and six-cylinder pump.

Front Drive Motor Company, Hoboken, N. J.—Christie tractor and steam fire pump.

Ahrens-Fox Fire Engine Company, Cincinnati, O.—Six-cylinder pump and combination chemical.

Waterous Engine Works Company, St. Paul, Minn.—Six-cylinder pump.

Luitwieler Pumping Engine Company, Rochester, N. Y.—Four-cylinder, 57 horsepower pump.

Martin Carriage Works, York, Penn.—Type A, four-cylinder combination hose and chemical wagon.

Nott Fire Engine Company, Minneapolis, Minn.—Two four-cylinder pumping engines and one six-cylinder.

There also was a large showing of parts and accessories, among which may be mentioned the patented wheel construction of the Sewell Wheel Company, Detroit; a gasoline storage system, for which special fireproof features were claimed, by the Martini & Huneke Company of America, New York City; fire extinguishers by the Pyrene Company, New York City; fire signals, fire protectors and life saving devices by the McNutt Non-Explosive Can Company, New York City, and products of the Sheldon Axle Company and Timken-Detroit Axle Company, Detroit; Republic

Rubber Company, Youngstown, O.; Dayton Rubber Manufacturing Company, Dayton, O.; B. F. Goodrich Company, Akron, O., and New Departure Manufacturing Company, Bristol, Conn.

Without doubt, the most interesting feature of the convention was the 12-hour continuous test of 11 pumping engines, conducted on the pier at the foot of West 54th street, Wednesday. The approximate capacities of the various machines had been determined at preliminary trials during the previous week, and this test com-

prised the following: Six hours' run at full capacity, at not less than 120 pounds net pressure, pumping through three lines of hose siamesed into one nozzle; three hours' run at not less than half capacity, at not less than 200 pounds net pressure, pumping through one line of hose and nozzle, and three hours' run at not less than 250 pounds net pressure, pumping through one line of hose and nozzle.

Not only was this the first test of this kind ever conducted, but the machines were turned over to a committee representing the National Board of Fire Underwriters, which supplied the officials and conducted every feature of the tests. The results presented in tabulated form on the next page therefore are of exceptional interest.



**Knox Combination Pumping Engine and Hose Wagon with Rotary Gear Pump.**



## DETAILED RESULTS IN PUMPING TEST.

No. 1—Seagrave, 1000 Gallons.

| Hour | Pump pressure | Size nozzle | Nozzle pressure | Mins. in operation | Gals. a minute | Total discharge |
|------|---------------|-------------|-----------------|--------------------|----------------|-----------------|
| 1    | 123           | 2.250       | 47.5            | 60                 | 1038           | 62,280          |
| 2    | 126           | 2.250       | 49.5            | 60                 | 1060           | 63,600          |
| 3    | 124           | 2.250       | 48.5            | 60                 | 1049           | 62,940          |
| 4    | 126           | 2.250       | 48.5            | 60                 | 1049           | 62,940          |
| 5    | 126           | 2.250       | 48.5            | 60                 | 1049           | 62,940          |
| 6    | 125           | 2.250       | 48.5            | 60                 | 1049           | 62,940          |
| 7    | 200           | 1.500       | 78.6            | 60                 | 591            | 35,460          |
| 8    | 208           | 1.500       | 79.8            | 60                 | 596            | 35,760          |
| 9    | 204           | 1.500       | 81.0            | 60                 | 600            | 36,000          |
| 10   | 255           | 1.125       | 74.4            | 60                 | 323            | 19,380          |
| 11   | 256           | 1.125       | 74.4            | 60                 | 323            | 19,380          |
| 12   | 256           | 1.125       | 73.8            | 60                 | 322            | 19,320          |

Grand total discharge.....542,940

Twenty minutes getting water at start on account of leaky suction joint, requiring additional washers to make tight. Tenth hour, slight noise in engine; does not appear serious; no cause was discovered on investigation after test.

No. 2—Ahrens-Fox, 700 Gallons.

| Hour | Pump pressure | Size nozzle | Nozzle pressure | Mins. in operation | Gals. a minute | Total discharge |
|------|---------------|-------------|-----------------|--------------------|----------------|-----------------|
| 1    | 125           | 1.750       | 60.4            | 60                 | 706            | 42,360          |
| 2    | 127           | 1.750       | 60.8            | 60                 | 709            | 42,540          |
| 3    | 128           | 1.750       | 62.3            | 60                 | 718            | 43,080          |
| 4    | 128           | 1.750       | 62.9            | 60                 | 721            | 43,260          |
| 5    | 130           | 1.750       | 63.8            | 60                 | 726            | 43,560          |
| 6    | 135           | 1.750       | 67.4            | 60                 | 746            | 44,760          |
| 7    | 209           | 1.250       | 61.0            | 60                 | 360            | 21,600          |
| 8    | 210           | 1.250       | 61.0            | 60                 | 360            | 21,600          |
| 9    | 212           | 1.250       | 61.0            | 60                 | 360            | 21,600          |
| 10   | 258           | 1.125       | 84.1            | 60                 | 343            | 20,580          |
| 11   | 260           | 1.125       | 85.8            | 60                 | 346            | 20,760          |
| 12   | 262           | 1.125       | 86.0            | 60                 | 347            | 20,820          |

Grand total discharge.....386,520

No remarks.

No. 3—American-La France, 700 Gallons.

| Hour | Pump pressure | Size nozzle | Nozzle pressure | Mins. in operation | Gals. a minute | Total discharge |
|------|---------------|-------------|-----------------|--------------------|----------------|-----------------|
| 1    | 122           | 1.750       | 62.0            | 60                 | 716            | 42,960          |
| 2    | 124           | 1.750       | 60.8            | 60                 | 709            | 42,540          |
| 3    | 124           | 1.750       | 60.3            | 60                 | 706            | 42,360          |
| 4    | 126           | 1.750       | 60.3            | 60                 | 706            | 42,360          |
| 5    | 126           | 1.750       | 61.4            | 60                 | 712            | 42,720          |
| 6    | 126           | 1.750       | 61.4            | 60                 | 712            | 42,720          |
| 7    | 222           | 1.125       | 90.0            | 60                 | 355            | 21,300          |
| 8    | 222           | 1.125       | 90.3            | 60                 | 355            | 21,300          |
| 9    | 222           | 1.125       | 90.6            | 60                 | 356            | 21,360          |
| 10   | 268           | 1.000       | 117.5           | 60                 | 321            | 19,260          |
| 11   | 267           | 1.000       | 117.5           | 15                 | 321            | 4,815           |

Grand total discharge.....343,695

Engine stopped at 5:20 due to broken fire pump bearings; bearing replaced at 6:11, but engine not started thereafter on account of motor trouble.

No. 4—Luitwieler, 600 Gallons.

| Hour | Pump pressure | Size nozzle | Nozzle pressure | Mins. in operation | Gals. a minute | Total discharge |
|------|---------------|-------------|-----------------|--------------------|----------------|-----------------|
| 1    | 120           | 1.625       | 40.1            | 60                 | 497            | 29,820          |
| 2    | 123           | 1.625       | 38.5            | 60                 | 486            | 29,160          |
| 3    | 118           | 1.625       | 35.0            | 32                 | 464            | 14,848          |
| 4    | 122           | 1.625       | 48.0            | 60                 | 543            | 32,580          |
| 5    | 121           | 1.625       | 37.5            | 60                 | 480            | 28,800          |
| 6    | 121           | 1.625       | 52.9            | 60                 | 570            | 34,200          |
| 7    | 198           | 1.250       | 45.9            | 60                 | 313            | 18,780          |
| 8    | 191           | 1.250       | 43.4            | 50                 | 304            | 15,200          |
| 9    | 175           | 1.250       | 45.0            | 22                 | 310            | 6,820           |

Grand total discharge.....210,408

First hour valve covers on Nos. 3 and 4 cylinders leaky—started at 6:50; engine working on Nos. 2 and 3 cylinders (ignition trouble); shifted to battery and engine worked O. K. Second hour, radiator steaming badly; carburetor out of adjustment and engine irregular in action; this was adjusted and engine worked O. K. Third hour, engine shut down at 8:54—clutch burned out; clutch set up tight and engine started up at 9:20. Eighth hour, bolt dropped out in cross head; shut down 1:47 to 1:57. Ninth hour, withdrew from test at 2:57; hot bearings.

No. 5—American-La France, 1400 Gallons.

| Hour | Pump pressure | Size nozzle | Nozzle pressure | Mins. in operation | Gals. a minute | Total discharge |
|------|---------------|-------------|-----------------|--------------------|----------------|-----------------|
| 1    | 130           | 2.250       | 84.7            | 60                 | 1386           | 83,160          |
| 2    | 130           | 2.250       | 85.2            | 15                 | 1390           | 20,850          |
| 3    | 133           | 2.250       | 86.7            | 60                 | 1402           | 84,120          |
| 4    | 134           | 2.250       | 88.3            | 60                 | 1415           | 84,900          |
| 5    | 130           | 2.250       | 88.8            | 60                 | 1419           | 85,140          |
| 6    | 133           | 2.250       | 86.7            | 60                 | 1402           | 84,120          |
| 7    | 209           | 1.750       | 62.5            | 60                 | 719            | 43,140          |
| 8    | 209           | 1.750       | 65.8            | 60                 | 736            | 44,160          |
| 9    | 209           | 1.750       | 67.8            | 60                 | 748            | 44,880          |
| 10   | 265           | 1.625       | 61.2            | 37                 | 613            | 22,686          |
| 11   | 269           | 1.625       | 65.7            | 60                 | 635            | 38,100          |
| 12   | 269           | 1.625       | 65.9            | 60                 | 636            | 38,160          |

Grand total discharge.....673,416

Second hour, stopped 8:35, air dome cracked; 9:05 run resumed with borrowed air dome. Tenth hour, No. 2 inlet valve spring broken and engine shut down 4:20; replaced and started again at 4:43.

No. 6—Knox, 600 Gallons.

| Hour | Pump pressure | Size nozzle | Nozzle pressure | Mins. in operation | Gals. a minute | Total discharge |
|------|---------------|-------------|-----------------|--------------------|----------------|-----------------|
| 1    | 126           | 1.625       | 57.9            | 60                 | 596            | 35,760          |
| 2    | 126           | 1.625       | 57.8            | 60                 | 595            | 35,700          |
| 3    | 114           | 1.625       | 52.2            | 43                 | 566            | 24,338          |
| 4    | 67            | 1.625       | 28.5            | 60                 | 419            | 25,140          |
| 5    | 68            | 1.625       | 28.8            | 60                 | 420            | 25,200          |
| 6    | 68            | 1.625       | 28.5            | 60                 | 419            | 25,140          |
| 7    | ...           | ...         | ...             | ...                | ...            | ...             |
| 8    | 231           | 1.625       | 24.7            | 60                 | 390            | 23,400          |
| 9    | 232           | 1.625       | 25.0            | 60                 | 392            | 23,520          |
| 10   | 261           | 1.500       | 28.3            | 60                 | 355            | 21,300          |
| 11   | 263           | 1.500       | 29.0            | 60                 | 359            | 21,540          |
| 12   | 262           | 1.500       | 29.6            | 60                 | 363            | 21,780          |

Grand total discharge.....282,818

Third hour, 9:00, pump plunger sleeve lugs broke; shut down 15 minutes. Seventh hour, 12:30-1:55, shut down for repairs to pump sleeve lugs.

No. 7—Nott, 600 Gallons.

| Hour | Pump pressure | Size nozzle | Nozzle pressure | Mins. in operation | Gals. a minute | Total discharge |
|------|---------------|-------------|-----------------|--------------------|----------------|-----------------|
| 1    | 129           | 1.625       | 63.5            | 60                 | 625            | 37,500          |
| 2    | 130           | 1.625       | 63.5            | 60                 | 625            | 37,500          |
| 3    | 133           | 1.625       | 65.0            | 60                 | 632            | 37,920          |
| 4    | 130           | 1.625       | 65.3            | 60                 | 633            | 37,980          |
| 5    | 129           | 1.625       | 64.7            | 60                 | 630            | 37,800          |
| 6    | 128           | 1.625       | 64.0            | 60                 | 631            | 37,860          |
| 7    | 203           | 1.250       | 44.6            | 60                 | 308            | 18,480          |
| 8    | 206           | 1.250       | 44.9            | 60                 | 309            | 18,540          |
| 9    | 194           | 1.250       | 42.6            | 55                 | 301            | 16,555          |

Grand total discharge.....280,135

First hour, valve rocker arm pin loose 7:45; missing fire occasionally at 7:45; O. K. at 8:00. Ninth hour, cylinder gasket in No. 2 leaked, allowing water in cylinder; engine stopped at 4:00.

No. 8—Robinson, 750 Gallons.

| Hour | Pump pressure | Size nozzle | Nozzle pressure | Mins. in operation | Gals. a minute | Total discharge |
|------|---------------|-------------|-----------------|--------------------|----------------|-----------------|
| 1    | 127           | 2.000       | 42.0            | 60                 | 770            | 46,200          |
| 2    | 127           | 2.000       | 42.6            | 27                 | 775            | 25,575          |
| 3    | 123           | 2.000       | 42.3            | 60                 | 773            | 46,380          |
| 4    | 124           | 2.000       | 44.5            | 60                 | 793            | 47,580          |
| 5    | 125           | 2.000       | 45.0            | 60                 | 797            | 47,820          |
| 6    | 128           | 2.000       | 45.1            | 60                 | 798            | 47,880          |
| 7    | 209           | 1.375       | 56.4            | 60                 | 420            | 25,200          |
| 8    | 216           | 1.375       | 54.0            | 60                 | 412            | 24,720          |
| 9    | 217           | 1.375       | 55.0            | 60                 | 416            | 24,960          |
| 10   | 246           | 1.000       | 110.0           | 60                 | 310            | 18,600          |
| 11   | 237           | 1.000       | 10.0?           | 60                 | 295            | 17,700          |
| 12   | 192           | 1.000       | 81.4            | 60                 | 267            | 16,020          |

Grand total discharge.....388,635

First hour, engine shut down 6:50 to 6:52 to replace bolt on end of fire pump connecting rod. Second hour, engine stopped 8:27 account of tight bearing; plenty of oil used and engine started up 9:00. Third hour, 9:15, pump bearings heated; cooled by application of water until 9:35; motor missing from 9:17 to 9:25. Ninth hour, pump bearings cooled by application of water at 4:15. Tenth



hour, 4:25 to end of test, pump operating poorly, owing to defective suction valves.

#### No. 9—Nott, 800 Gallons.

|    |       |       |      |    |     |        |
|----|-------|-------|------|----|-----|--------|
| 1  | 128   | 2.000 | 47.9 | 60 | 823 | 49,380 |
| 2  | 129.2 | 2.000 | 48.2 | 46 | 826 | 37,996 |
| 3  | 133   | 2.000 | 50.4 | 45 | 844 | 37,980 |
| 4  | 133   | 2.000 | 50.0 | 60 | 841 | 50,460 |
| 5  | 132   | 2.000 | 50.1 | 60 | 842 | 50,520 |
| 6  | 132   | 2.000 | 50.0 | 60 | 841 | 50,460 |
| 7  | 189   | 1.375 | 49.8 | 60 | 395 | 23,700 |
| 8  | 184   | 1.375 | 49.3 | 60 | 393 | 23,580 |
| 9  | 182   | 1.375 | 49.3 | 60 | 393 | 23,580 |
| 10 | 248   | 1.125 | 45.0 | 60 | 251 | 15,060 |
| 11 | 250   | 1.125 | 45.0 | 60 | 251 | 15,060 |
| 12 | 249   | 1.125 | 44.3 | 60 | 249 | 14,940 |

Grand total discharge.....392,716

First hour, valve rocker arm bolts loose on Nos. 5 and 6 cylinders 7:45; engine continued in operation. Second hour, missing on No. 4 cylinder; inlet valve spring broken at 8:00; shut down at 8:16 to replace and started up at 8:45. Third hour, riveted rocker arm pins to prevent loosening, while engine was in operation. Fifth hour, valve rocker arm bolts loose on cylinders Nos. 3 and 4; broke valve rod yoke on No. 3 cylinder at 11:20; this was replaced during first shift of hose at 12:30. Ninth hour, inlet valve springs on Nos. 1 and 2 cylinders broken just before 3:45.

#### No. 10—Robinson, 900 Gallons.

|   |     |       |      |    |     |        |
|---|-----|-------|------|----|-----|--------|
| 1 | 124 | 2.000 | 56.2 | 60 | 891 | 53,560 |
| 2 | 127 | 2.000 | 57.3 | 60 | 899 | 53,940 |
| 3 | 129 | 2.000 | 57.6 | 60 | 902 | 54,120 |
| 4 | 116 | 2.000 | 50.3 | 60 | 843 | 50,580 |
| 5 | 111 | 2.000 | 48.3 | 60 | 827 | 49,620 |

No. 1—Seagrave pumping engine, rated at 1000 gallons at 120 pounds pressure, 500 at 200, and 300 at 250. Net weight, without men or hose, 16,370 pounds; tires, solid, five-inch single forward, four-inch dual rear; tread, 68 inches; wheelbase, 14 feet four inches. Engine, own make, six-cylinder, 7.75-inch bore, nine-inch stroke, 144 horsepower. Gear ratio, engine to pump, 1:3.6. Centrifugal pump, three-stage, 11-inch impeller. One gasoline tank, 60 gallons. Height of pump from ground, 43 inches.

No. 2—Ahrens-Fox pumper with hose body, rated at 700 gallons at 120 pounds, 350 at 200 and 330 at 250. Net weight, 14,520 pounds; tires, solid, six-inch single forward, four-inch dual rear; tread, 66 inches; wheelbase, 12 feet four inches. Engine, Herschel-Spillman, built to plans of Ahrens-Fox Fire Engine Company, six-cylinder, 5.75-inch bore, 6.5-inch stroke; 79.3 horsepower. Gear ratio, engine to pump, 3.11:1 and 4.33:1. Pump, two-cylinder, double-acting, steamer type; 6.5-inch bore, four-inch stroke. One gasoline tank, 45 gallons. Height of pump above ground, 45 inches.

No. 3—American-La France, triple combination, rated at 700 gallons at 120 pounds, 350 at 200 and 325 at 250. Net weight, 8925 pounds; rear wheels, 5395 pounds; tires, Dayton airless, 4.5-inch single forward, 4.5-inch dual rear; tread, 62 inches; wheelbase, 13 feet two inches. Engine, own make, six-cylinder, 5.5-inch bore, six-inch stroke, 72.6 horsepower. Gear ratio, engine to pump, 1.66:1 and 3:1. Pump, rotary gear; displacement, 1.25 gallons a revolution. Two gasoline tanks, 11 and 28 gallons. Height of suction, 33 inches.

No. 4—Luitwieler, combination pumping engine and hose wagon, rated at 600 gallons at 120 pounds, 300 at 200 and 200 at 250. Net weight, 10,200 pounds; rear wheels, 6200 pounds; tires, solid, four-inch single forward, five-inch single rear; tread, 58 inches; wheelbase, 11 feet seven inches. Engine, Trebert, four-cylinder, six-inch bore, 6.5-inch stroke, 57.6 horsepower. Gear ratio, engine to pump, 11.78:1, 24.79:1 and 36.14:1. Pump, three-cylinder, double-acting, six-inch bore, 12-inch stroke, displacement, 8.581 gallons a revolution. One gasoline tank, 30 gallons. Height of suction, 25 inches.

No. 5—American-La France combination pumping engine and hose wagon, rated at 1400 gallons at 120 pounds, 700 at 200 and 640 at 250. Net weight, 12,770 pounds; rear wheels, 6760 pounds; tires, solid, five-inch single forward, five-inch dual rear; tread, 63 inches; wheelbase, 14 feet six inches. Engine, own make, six-cylinder, 7.125-inch bore, eight-inch stroke, 126.2 horsepower. Gear ratio, engine to pump, 2.15:1 and 4:1. Pump, rotary gear;

|   |     |       |      |    |     |        |
|---|-----|-------|------|----|-----|--------|
| 6 | 111 | 2.000 | 48.3 | 60 | 827 | 49,620 |
| 7 | 211 | 1.375 | 64.0 | 60 | 448 | 26,880 |
| 8 | 212 | 1.375 | 64.1 | 60 | 448 | 26,880 |
| 9 | 216 | 1.375 | 65.1 | 60 | 452 | 27,120 |

Grand total discharge.....392,320

Second hour, water from radiator cap was blown by fan against spark plug, so belt was taken off. Fourth hour, No. 6 cylinder missing at 9:50; operator said cylinder was cracked; occasionally No. 6 cylinder would operate. Seventh hour, No. 2 inlet and No. 6 exhaust valve springs broken. Eighth hour, 2:00, No. 6 inlet valve spring broken. Ninth hour, 2:25 till time of shut down (4:57) plunger packing leaked. Tenth hour, engine shut down at 4:57 account pump trouble, caused by leaky valves.

#### No. 11—Waterous, 700 Gallons.

|    |     |       |       |    |     |        |
|----|-----|-------|-------|----|-----|--------|
| 1  | 123 | 1.750 | 55.4  | 60 | 678 | 40,680 |
| 2  | 119 | 1.750 | 53.8  | 60 | 667 | 40,020 |
| 3  | 124 | 1.750 | 55.8  | 60 | 678 | 40,680 |
| 4  | 124 | 1.750 | 56.4  | 60 | 682 | 40,920 |
| 5  | 126 | 1.750 | 56.4  | 60 | 682 | 40,920 |
| 6  | 127 | 1.750 | 58.1  | 60 | 693 | 41,580 |
| 7  | 216 | 1.125 | 88.6  | 60 | 352 | 21,120 |
| 8  | 217 | 1.125 | 90.1  | 60 | 355 | 21,300 |
| 9  | 220 | 1.125 | 91.7  | 60 | 359 | 21,540 |
| 10 | 261 | 1.000 | 111.1 | 60 | 312 | 18,720 |
| 11 | 267 | 1.000 | 109.0 | 60 | 309 | 18,540 |
| 12 | 258 | 1.000 | 107.7 | 60 | 307 | 18,420 |

Grand total discharge.....364,440

First hour, engine varying in speed, missing occasionally; carburetor popping, due probably to air in gasoline line; settled down to good action in about two hours.

displacement, four gallons a revolution. Two gasoline tanks, 28 and 15 gallons. Height of suction, 36 inches.

No. 6—Knox combination pumping engine and hose wagon, rated at 600 gallons at 140 pounds, 400 at 200 and 325 at 250. Net weight, 14,010 pounds; rear wheels, 7330; tires, solid, five-inch single forward, five-inch dual rear; tread, 70 inches; wheelbase, 14 feet four inches. Engine, own make, six-cylinder, five-inch bore, six-inch stroke, 60 horsepower. Gear ratio, engine to pump, 6.47:1 and 3.77:1. Pump, two-cylinder, double-acting; five-inch bore, eight-inch stroke. One gasoline tank, 30 gallons. Height of suction, 32.5 inches.

No. 7—Nott combination pumping engine and hose wagon, rated at 600 gallons at 120 pounds, 300 at 200 and 250 at 250. Net weight, 12,300 pounds; rear wheels, 6800 pounds; tires, solid, five-inch single forward, six-inch rear; tread, 71 inches; wheelbase, 11 feet 8.5 inches. Engine, own make, four-cylinder, 6.5-inch bore, eight-inch stroke, 67.6 horsepower. Gear ratio, engine to pump, 1.2:1. Pump, rotary roller, dual or single-acting; displacement, .98 gallon a revolution. One gasoline tank, 40 gallons. Height of suction, 46.5 inches.

No. 8—Robinson, combination pumping engine and hose wagon, rated at 750 gallons at 120 pounds, 400 at 200 and 300 at 250. Net weight, 11,600 pounds; rear wheels, 6160 pounds; tires, solid, five-inch single forward, six-inch single rear; tread, 60.5 inches; wheelbase, 14 feet four inches. Engine, Buffalo Gasoline Motor Company's, six-cylinder, 6.25-inch bore, 6.75-inch stroke, 93.7 horsepower. Gear ratio, engine to pump, 3:1. Pump, three-cylinder, single-acting; six-inch bore, eight-inch stroke; displacement, 2.938 gallons a revolution. One gasoline tank, 30 gallons. Height of suction, 39.5 inches.

No. 9—Nott combination pumping engine and hose wagon, rated at 800 gallons at 120 pounds, 400 at 200 and 360 at 250. Net weight, 14,360 pounds; rear wheels, 8150 pounds; tires, solid, six-inch single forward, five-inch dual rear; tread, 71 inches; wheelbase, 11 feet 8.5 inches. Engine, own make, six-cylinder, 6.5-inch bore, eight-inch stroke, 101.4 horsepower. Gear ratio, engine to pump, 1.3:1. Pump, rotary roller, dual or single-acting; displacement, 2.63 gallons a revolution. One gasoline tank, 40 gallons. Height of suction, 46.5 inches.

No. 10—Robinson combination pumping engine and hose wagon, rated at 900 gallons at 120 pounds, 500 at 200 and 350 at 250. Net weight, 11,150 pounds; rear wheels, 5890 pounds; tires, solid, five-inch single forward, six-inch single rear; tread, 60 inches; wheelbase, 14 feet five inches. Engine, Buffalo Gasoline Motor Company's,



six-cylinder, 6.25-inch bore, 6.75-inch stroke, 93.7 horsepower. Gear ratio, engine to pump, 2.5:1 and 3.75:1. Pump, three-cylinder, single-acting, six-inch bore, eight-inch stroke; displacement, 2.938 gallons a revolution. One gasoline tank, 30 gallons. Height of suction, 37.75 inches.

No. 11—Waterous combination pumping engine and hose wagon, rated at 700 gallons at 120 pounds, 350 at 200 and 300 at 250. Net weight, 13,830 pounds; rear wheels, 9060 pounds; tires, solid, five-inch single forward, four-inch dual rear; tread, 69 inches; wheelbase, 11 feet four inches. Engine, own make, six-cylinder, 6.5-inch bore, seven-inch stroke, 101.4 horsepower. Gear ratio, engine to pump, 2.23:1. Pump, four-cylinder, single-acting, 4.75-inch bore, eight-inch stroke; displacement, 2.455 gallons a revolution. Two gasoline tanks, 20 gallons. Height of suction, 23.25 inches.

At the conclusion of the test the motors were inspected, all the bearings, pistons, cylinders, valves, etc., being found to be in good condition except the following: No. 4, no inspection, as machine was withdrawn from the test; 7, gasket leaks on No. 2 cylinder, nut gone from one valve

The following tabulation shows the total time each machine was in service, the maximum and minimum suction lift and the amount of gasoline used:

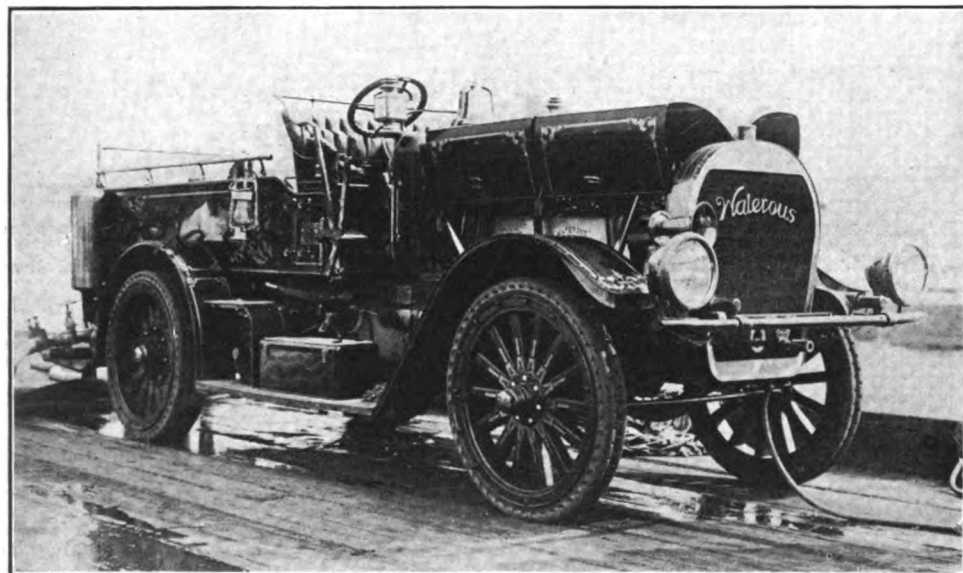
| No. | Time |       | Max. Lift |     | Min. Lift |     | Fuel Gals. |
|-----|------|-------|-----------|-----|-----------|-----|------------|
|     | Hrs. | Mins. | Ft.       | In. | Ft.       | In. |            |
| 1   | 12   | 0     | 14        | 1   | 8         | 7   | 219        |
| 2   | 12   | 0     | 14        | 3   | 8         | 9   | 117        |
| 3   | 10   | 15    | 13        | 3   | 7         | 9   | 108        |
| 4   | 7    | 34    | 12        | 7   | 7         | 1   | 56.75      |
| 5   | 10   | 52    | 13        | 6   | 8         | 0   | 255        |
| 6   | 10   | 43    | 13        | 2   | 7         | 8   | 102        |
| 7   | 8    | 55    | 14        | 4   | 8         | 10  | 106        |
| 8   | 11   | 27    | 13        | 9   | 8         | 3   | 144        |
| 9   | 11   | 31    | 14        | 4   | 8         | 10  | 159        |
| 10  | 9    | 0     | 13        | 8   | 8         | 2   | 100        |
| 11  | 12   | 0     | 12        | 6   | 7         | 0   | 148        |

During the week several papers were read by members of the association, many of them having to do with subjects intimately connected with

the work of the fireman, and insurance. Motorized equipment was discussed in three of these papers, extracts from which appear in succeeding pages.

The election of officers for the ensuing year resulted as follows: President, Thomas Hanley, Jacksonville, Fla.; first vice president, Hugo Lelphs, Lansing, Mich.; second vice president, Harry L. Marston, Brockton, Mass.; secretary, James McFall, Roanoke, Va.;

treasurer, George Knofflock, Mansfield, O. This action means that the two first named were each promoted one step, and that the last two were re-elected, Chief Marston being the only new member of the official board. The convention was a decided success in every respect, and the results obtained by the tests will mean much to the automobile industry. The 1914 convention will be held in New Orleans.



The Waterous Pumping Engine, One of the Three Which Worked the Full 12 Hours.

rocker arm bolt; 8, Nos. 2 and 3 connecting rods each had loose check nuts on cap bolts, could not come off on account of cotter pins ("holding" nuts tight); 9, one valve rocker arm bolt broken, three valve rocker arm bolts loose, nuts and washers missing, two inlet valve springs broken; 10, leak from water jacket into No. 6 cylinder, allowing water to enter cylinder and crankcase; three valve springs broken.

**Cooper and the Stutz Again**—A dispatch from Corona, Cal., says that Earl Cooper in a Stutz car finished first in the medium car race, 251.97 miles, and the free-for-all, 301.81 miles, at the opening of the motordrome in that city, Sept. 9. His time for the first event was 3:21:29.2, and for the second, 4:02:38.

While practising for the automobile races at Jackson, Mich., Harry Endicott, brother of William Endicott, and one of the best known racing drivers in the country, was instantly killed, Sept. 5. It is understood that Endicott was at the wheel of a powerful 100 horsepower Cutting machine.



## BRITISH MOTOR FIRE-FIGHTING ENGINES.

(Extract from paper read by Divisional Chief Arthur Reginald Dyer, London, England, at the convention of the International Association of Fire Engineers in New York City.)

Before entering on the subject of motor fire appliances, a brief explanation of the system adopted in London of dispatching appliances in response to calls is subjoined, in order that the conference may understand the duties required from the various types adopted.

The area to be protected is 117 square miles, which, with the exception of the public parks and some small areas at the extremities of the Metropolis, is entirely covered with buildings. There are at present for this area 85 land fire stations and three floating stations; of the former 18 are entirely equipped with motors and 12 partially so.

Each station is equipped with a fire escape van carrying a ladder capable of being extended to at least 50 feet and also furnished with supplementary ladders, hose and tools for getting to work from hydrants, and a cylinder holding about 30 gallons of water, fitted with 180 feet of rubber garden hose .75 inch inside diameter, for extinguishing small fires. This appliance, the crew of which is on duty night and day, is ready for an instantaneous turn-out and only attends fires on the ground immediately protected by the station; the distance it may travel to fires rarely exceeds one mile. The yearly mileage of escape vans is about 600 a machine.

Most stations are also equipped with an engine or motor pump, and in a few localities with two engines, all of which carry hose, etc.; these engines besides attending fires in the vicinity of the stations at which they are kept, are considered available for service at any fire in the area protected. The yearly mileage may be taken at 1200 a machine, but in addition they perform heavy duty pumping at fires sometimes for 24 hours without intermission.

Stations in localities where there are many high or warehouse buildings, are equipped with long ladders extending from 75 to 90 feet. These appliances, while intended generally speaking for attending local calls, are considered available in case of serious fires in high buildings within a radius of about five miles. The yearly mileage run does not exceed 1000 a machine.

Other motor appliances in use are lorries (trucks) for carrying on from the central stations, coal and oil fuel for the steam fire engines, petrol (gasoline) for motor pumps, and also additional hose and acetylene water lights, etc., to large fires, and delivering stores regularly to stations; tenders for taking on the principal officers and their orderlies to fires, and also self-contained oxygen smoke helmets, cellar pipes, marine torches (acetylene), etc.; instruction tenders for training the men undergoing instruction in motor driving. These are not the oldest motor appliances available, but modern ones with chassis similar to those in use for pumps, escape vans, etc.

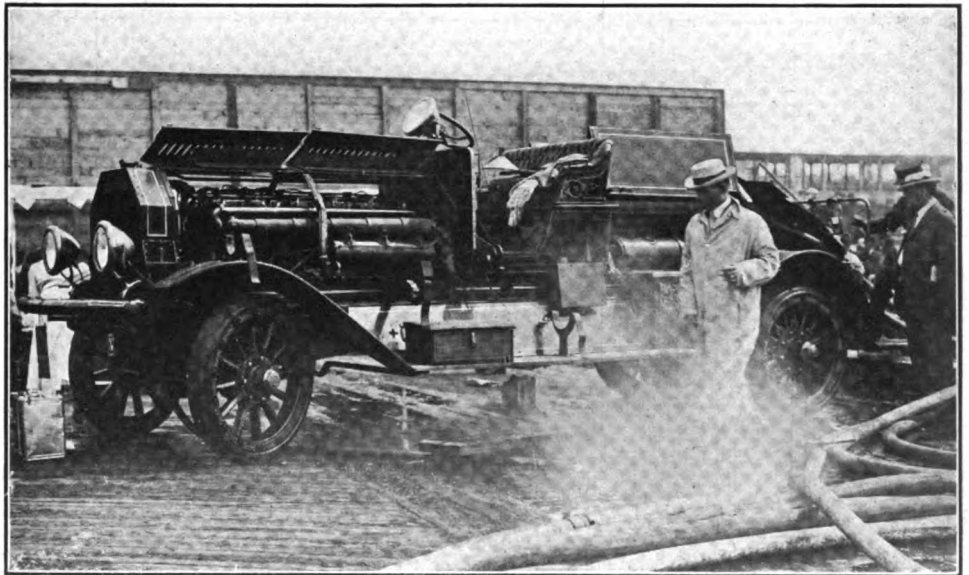
Motor cars for officers have been in use since 1901 and shortly after that an attempt was made to draw an existing land steam fire engine by a motor tractor, the front axle being removed, making altogether a six-wheeled appliance. It was found impossible, however, to travel at sufficiently high speeds with this without undue skid-

ding and the principle was abandoned.

In 1902 an existing steam fire engine was converted to a motor engine by providing a separate engine for propulsion, the steam being supplied by the fire engine boiler; after a time, however, this was abandoned and the appliance was reconstructed for horse traction.

The first success in replacing horsed fire engines and horsed escape vans by mechanically driven vehicles occurred in 1905-1906, when steam motor fire engines and petrol motor escape vans were obtained. With the former it was found that as the appliance had to be ready for an immediate turn-out, a pressure from 80 to 100 pounds a square inch had to be maintained in the boiler, and owing to the excessive vibration on this type of boiler on the road necessitating considerable repairs, and also to the large expense incurred in maintaining this pressure by gas, the steam system was abandoned.

With regard to the petrol motor escape vans the first supplied only gave moderate satisfaction as manufacturers generally had no experience in the running of motors (weighing about 11,200 pounds with load) at speeds exceeding 20 miles an hour to guide them, the principal defects being under-tiring, want of sufficient strength in



Chief Kenlon of New York City inspecting the Seagrave during the pumping test.

the fittings to withstand the excessive vibration, and inadequate springing, indeed prior to 1910 it was considered necessary to have one spare escape van for every one on duty in order to maintain an efficient service, whereas at present only one in five motor escape vans or motor pumps is necessary. The experience with early petrol fire engines fitted with pumps was somewhat similar.

From the first introduction of heavy engines capable of high speed the problem of providing a satisfactory non-skid engaged attention. Some mitigation of the inconvenience was found by utilizing chains festooned diagonally across the tires, but considerable damage was caused to the rubber, which when worn, allowed the chains to come in contact with the iron rims, causing the non-skid chains to break and not unfrequently jam in the driving chains, or to allow the loose ends to tear the mudguards, etc. Other devices were tried to check the tendency to skid, such as studded leather covers and transverse bands of steel studded balata belting fitted into slots cut into the rubber of the tire. The latter were found to be most effective when tires and bands were new, but gave endless trouble when partly worn.

One motor pump was fitted experimentally with a gyroscope behind the radiator, but it was removed as a swaying motion was set up when travelling at high



speeds. In addition to this the steering was rendered uncertain.

One appliance has run for a year without non-skids, but with soft rubber tires of flat tread and extra wide section, single on front wheels, twin on hind wheels; although no skidding has taken place there is still some doubt if fire engines can be safely run under all conditions in London without some non-skid attachment.

Front wheel brakes were tried on the appliances supplied by different manufacturers in 1910 in order (it was hoped) to obviate the effects of skidding, but whilst satisfactory results were obtained on tests they were found unsuitable in practise and have now been removed from the appliances and rear wheel or differential brakes fitted in lieu.

The difficulties formerly experienced have now been fairly overcome as follows: (a) by careful training and the continued experience of drivers; (b) by allowing greater cross section in tires; (c) by extra heavy leather steel-studded covers fitted on two wheels only, one front wheel, one hind wheel.

#### Escape Vans.

The author has up to now referred only to the early attempts to introduce motor traction in the place of horses and the experience gained was extremely valuable both to the fire brigade officials and the manufacturers. It is now proposed to deal only with what may be termed

eight fully laden, at a speed of about six mph or a moderate gradient at 15 mph.

The weight of the appliance fully laden is about 600 pounds more than a corresponding petrol van. Undoubtedly petrol motor escape vans are required for localities where stiff gradients have to be encountered.

The type found satisfactory has the following general features: Four-cylinder engine, five-inch bore by 5.5-inch stroke, giving about 50 brake horsepower; double ignition, Bosch magneto and accumulator and coil; speed about 30 miles an hour.

The engine is started up in the station every four hours, day and night. Where the engine room at the station is not warmed with hot water or gas radiators, electric heaters are hung over the front of the radiator to warm the engine and keep it ready for an immediate start in cold weather.

The appliance weighs about 11,200 pounds fully laden and has 4.5-inch tires on front wheels and 5.5-inch on rear.

#### Pumps.

A modern petrol pump used in the London fire brigade has a four-cylinder engine, five-inch bore and 7.125-inch stroke, giving 58 bhp at 1000 rpm and 65 bhp at 1100 rpm. Speed, 30-40 mph. Weight about 11,200 pounds fully laden with men, gear and hose. Tires are single, 4.5-inch front and single, 5.5-inch rear. The pump is centrifugal (usually termed turbine) and geared up from the engine. It is placed at the rear of the appliance and can be controlled from there or from the driver's seat.

It is now found that for London the two, three or four-stage centrifugal pump is capable of fulfilling all the required conditions and only this type has latterly been specified. The pump gives an output of 500 English gallons (American, 600 gallons,) a minute at a working pressure of over 120 pounds square inch.

There is a considerable controversy among fire engineers in Great Britain as to whether the reciprocating or centrifugal pump is the most suitable for the duty required of fire engines. The mechanical efficiency of the reciprocating pump is 10 to

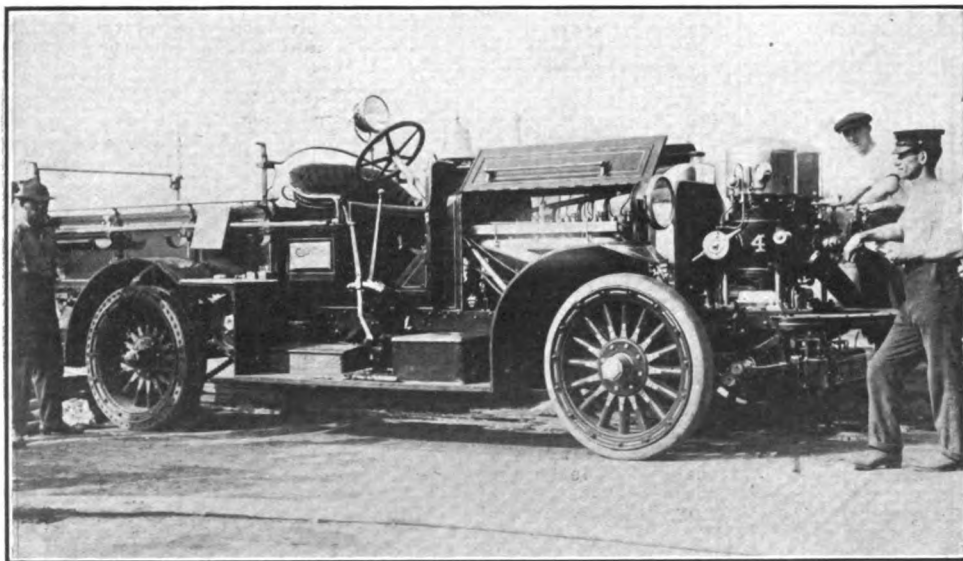
15 per cent. higher than the centrifugal; the pump can run slower when discharging a small quantity of water at high pressure and can pick up its own water when drawing from a canal or dock without the aid of a vacuum pump, which is necessary for the latter.

The centrifugal pump has to run fast in order to obtain even a small quantity at high pressure. On the other hand when delivering at lower pressures a larger volume can be delivered than from the reciprocating.

One great advantage of the centrifugal pump is the possibility of working two pumps in series when a high pressure is required, or in parallel when a large volume is required for one jet. Under the former conditions an efficient jet was thrown over the top of St. Paul's Cathedral 340 feet above pavement level. The jets commonly obtained from standard large sized American steam fire engines can also be obtained by working two of the smaller capacity motor pumps as described above.

In London it is necessary that in addition to the pump at least 600 feet of rubber lined canvas hose 2.75 inches inside diameter, besides the necessary small gear and five men, be carried. The speed of the appliance is greater than that of motor escape vans.

Although at present in the outlying suburban stations smaller horsed steam fire engines are stationed than those in the central area stations where the fire risk is greater, it has been found best to equip the former sta-



The Ahrens-Fox, Concerning the Work of Which No Criticism Was Offered.

motor appliances at present in use.

Perhaps the most successful type of appliance to be introduced has been the electric motor escape van, for service in localities where only moderate gradients are encountered, the first of this kind being obtained in 1911.

The power is provided by a battery of 84 cells of 195 ampere-hours capacity, giving a normal running output of about 30 horsepower. The appliance runs about 30 miles on one charge if necessary, but owing to the nature of its service it stands fully charged ready to give out the maximum output on receipt of a call.

The motors are in the front wheels, the fields being fixed to the stub axle around which the armature revolves with the wheel. The tires are single five-inch on all wheels.

There are electric brakes on the front wheel motors which are valuable in emergencies, while two mechanical brakes on the rear wheels are sufficient under ordinary circumstances. The control is of the series-parallel type with five notches forward and reverse, and two brake positions.

The weight of the appliance ready for running, but without ladders, hose and small gear and men, does not exceed 8300 pounds, the total weight of the machine complete being 11,800 pounds. A speed of 25 miles an hour is maintained with full load on a level and good road, and the machine is capable of ascending a gradient of one in



tions with the same sized motor pump as in use elsewhere, as the additional pumping capacity is available when an engine is ordered on to large fires, also the additional distance to be covered need not be considered as in the case of horsed engines.

#### Turntable Long Ladders.

At present the brigade is only equipped with two motor turntable long ladders. These can be extended to a height of 90 feet and can be safely used as a water tower at a height of 60 feet. In both cases the system of propulsion is by electric storage batteries and hub motors in the wheels. In one design the wheel motors are interchangeable with those on the motor vans for carrying escapes and drive on the front wheels. In another type the battery is of the same capacity and manufacture, but the motors are fitted to the rear wheels.

It is not considered necessary to specify for these appliances to travel at a speed of more than 20 mph. The total weight of the appliance with ladders is about 13,800 pounds. It is probable that by adopting motor long ladders a number of the existing horsed long ladders will be dispensed with, two of which are being adapted for electric traction.

#### Lorries.

The first lorry to be procured was a standard five-ton (11,200 pounds) machine from one of the largest lorry builders. It is fitted with a four-cylinder engine, 5.5-inch bore and 6.5-inch stroke, having an output of 55 bhp at 1000 rpm, and is capable of a speed of 30 mph. It is fitted with five-inch tires on front wheels and twin five-inch on rear; no non-skids are provided. A covered hood is fixed.

A second lorry has been ordered. This will be one of the standard three-ton (6720 pounds) type, similar in most respects to the larger machine. It will have a four-cylinder engine, 4.75-inch bore and five-inch stroke, giving an output of 45 bhp at 1000 rpm. This machine will be kept at the chief station in one of the districts and will be used in a similar manner to the other appliance.

#### Motor Tenders.

Those at present in use for carrying principal officers to fires and other work are standard chassis by well known makers. In one case large pneumatic tires 35.5 by 5.5 inches (895x135 mm) are fitted, with detachable rims. On this machine four men are carried besides the gear mentioned previously, the total weight being 4410 pounds, and no trouble has been experienced with the pneumatic tires. Indeed the instruction tender, which is of similar pattern and drive, has also been recently adapted for pneumatic tires instead of solid ones.

At some suburban stations motor tenders are allocated in addition to the motor escape van that in the event of the latter being required elsewhere the tender may be at once dispatched with sufficient men, hose, hook ladders, etc.

#### Motor Cars.

The cars in use, of which there are 13, are of standard pattern by well known makers, and are mostly fitted as touring cars. They are used both for inspection work and also for proceeding to fires. The superintendents in each of the six districts are now provided with two-seater touring cars for daily inspection of the stations in their districts, also for taking them on to fires. Smoke helmets are carried in those cars.

## MOTOR APPARATUS; ITS DURABILITY, ETC.

(Extract from paper read by Chief A. V. Bennett, Birmingham, Ala., at the convention of the International Association of Fire Engineers in New York City.)

The desperate rivalry existing between our cities and their mad race to excel their neighbor in population, has prompted the extension of the corporate limits from time to time so as to include vast tracts of sparsely settled territory. This, together with the automobile and the trolley car, has introduced a new condition, and developed new difficulties for those who were charged with the duty of furnishing fire protection.

The automobile has enabled the man of wealth to establish a home in the outlying districts, where he may enjoy the comforts of country life and still be near the scene of his daily activity. The trolley car has made it possible for the man of moderate means to establish himself in the suburbs, where he and his family can live in surroundings that would cost him twice as much were his home in the heart of the city.

The country and suburban movements have grown to tremendous proportions during the past few years, and at the present time we are experiencing the heyday of their popularity. The people who have become commuters and still reside in the city are as much entitled to fire protection as those who reside in the heart of the congested district. In an effort to meet these new conditions, even those municipalities that were erecting new fire stations, and providing additional men and equipment each year, still found themselves confronted with vast expanses of territory that was too far to be reached in time to render efficient service with the horse drawn machine.

To provide means of transporting men and appliances over larger areas fast enough to do successful fire fighting; to provide efficient fire protection for vast stretches of sparsely settled territory, was a problem that again called into service the inventive genius, who, after years of earnest effort, hardship and disappointment, and the expenditure of huge sums of money by the manufacturer, has at last succeeded in giving us the modern, efficient and reliable self-propelled fire apparatus.

The motorizing of a fire department, however, like all radical changes from an established custom, is fraught with many difficulties, and means far more than merely consigning the faithful fire horse to green pastures, and substituting the tireless machine to perform his duty. One of the first, and perhaps the greatest problems with which you are confronted, is the proper training of men to operate the machines successfully. This is especially

true of cities that are too small, or for other reasons, are unable to establish and maintain regular training schools.

To the average citizen, who sees our streets thronged with automobiles driven by women and children and irresponsible men, the driving of a piece of motor fire apparatus to a fire is an act of small consequence, and requires little ability or training. Such, however, is not the case, as is evidenced by the many accidents, fatal and otherwise, that have occurred throughout our country since the introduction of the motor machine.

In the first place, your motor fire apparatus driver is a fireman, animated by all the enthusiasm that permeates the profession. This prompts the desire to reach the scene of fire at the earliest possible moment, that he and his company may give the best account of themselves in the fight which is to be made. This enthusiasm, which, of course, must not be destroyed, has a tendency to recklessness and the reckless driving of a heavy piece of motor fire apparatus through crowded streets is dangerous to the public, and ruinous to the machine and sooner or later results disastrously.

After you have succeeded in training a member of your department to be a careful and successful driver of your motor machine, you have taught him a new trade, and his services are immediately in demand by owners of commercial vehicles, who are in position to pay better salaries or to offer shorter hours, with the result that your best men are often lost to your department when their services are most valuable.

The useless racing of the engine while the car is standing; the engaging of the clutch with the engine racing in starting the car, causing extreme and unnecessary strain on every part of the apparatus, even to twisting the frame work; the engaging of the transmission gears before the clutch has ceased to revolve, and the engaging of the reverse gear while the car is in forward motion; the too rapid driving of the machine to the immediate scene of the fire, or to quarters on returning, necessitating the too rigid application of brakes, subjecting the car to useless strain and costly repairs to wheels and tires; the reckless driving of the machine around street corners, causing unnecessary strain on all the parts, inducing skidding and resulting in many unnecessary accidents; fast driving over cobblestones, grade crossings and rough streets, which tends to crystallize axles, steering knuckles, etc., are a few of the things that your inexperienced driver is apt to do. In the motorizing of your fire department, many other problems are to be solved, but the durability, efficiency and economy of operation of your machine depend almost entirely



on the care, judgment and skill of the driver in the handling of the car.

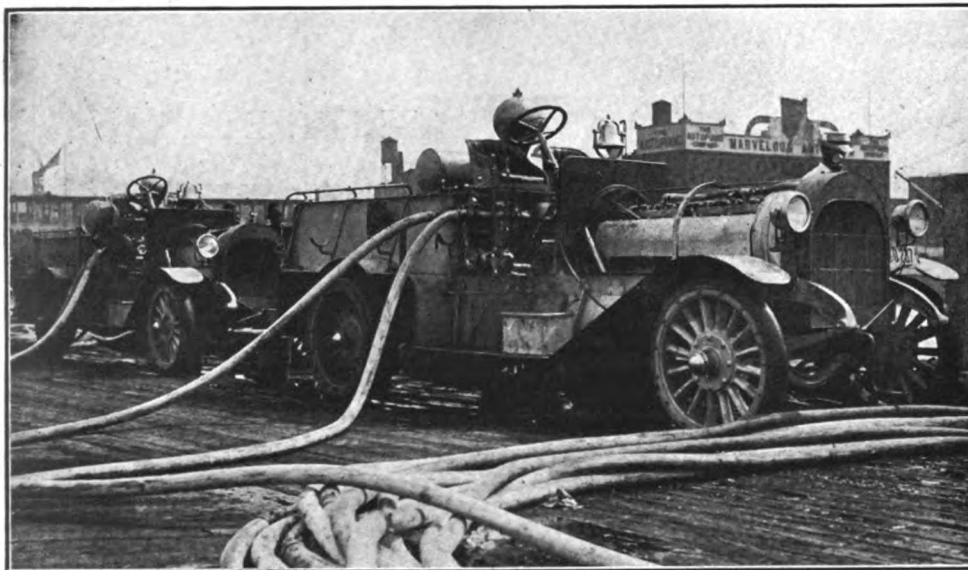
#### **Durability.**

The durability of the motor machine, if properly handled, should be almost indefinite, since its radius of action is comparatively small, and its mileage a year in many instances less than 100 miles, and in very few cases exceeding 500 miles. In the majority of alarms answered the entire distance to and from the fire is over paved or well kept streets, which reduces the wear and tear of the machine to a minimum.

#### **Efficiency.**

The motor's chief claims to efficiency is its speed and ability to continue indefinitely without tiring. By its speed we are enabled to extend its radius of action over a territory two or three times as great as that covered by the horse drawn machine and still obtain efficient fire service.

We have, on several occasions, covered a distance of three or four miles with our motor machines, and extinguished fires with small damage, originating in ordinary frame residences. Of course, this does not mean that the number of companies or the number of men employed before the installation of the motor should be reduced, for in the handling of large fires, in your congested district, you will unquestionably require the services of as many men and as many pieces of apparatus as formerly.



**The Two Nott Engines, Six-Cylinder in Front and Four in the Rear.**

Nor does the motorizing of your department mean that you will only be required to establish engine houses in a radius of three or four miles of each other in your densely populated residence section. But it should mean more efficient service in all sections of your city and that engine houses will not be required in the immediate vicinity in order to furnish protection to your sparsely settled territory.

The motor machine perhaps in no way more clearly demonstrates its efficiency than in the prompt manner in which second alarm companies reach the scene of the fire. This is especially true in the residential sections of the smaller cities, where second alarm companies have a great distance to traverse. Their prompt arrival on the scene is always a source of gratification to the officer in charge.

#### **Reliability.**

The reliability of motor apparatus has been a question of grave concern among fire department officials and others interested in fire protection. Such questions, as, Will the motor negotiate steep hills? or muddy streets? or deep sand? soft and hard snow? have been the subject of much correspondence between officials whose cities had already bought, and those who were contemplating buying the modern equipment.

By actual tests, the motor has proven to be as free from break-downs and delays, if properly handled, as the

horse drawn machine, and should be considered equally as reliable and trustworthy under all circumstances. In negotiating hills, your motor will climb grades with comparative ease that it is impossible to ascend with the horse drawn machine. In muddy streets, through sand or snow, if your motor machine can get traction it will plow through bad stretches that with one pair of horses hauling your heavy fire apparatus would be sure to fail.

#### **Economy of Operation.**

The cost of operating motor fire apparatus is rather difficult to determine accurately as yet, because of the uncertainty of depreciation and necessary repairs due to actual wear and tear. The expense of operation, however, is largely controlled by the ability and care of the driver in handling your machine, who will raise the cost to abnormal proportions, or lower it decidedly below that of the horse drawn machine doing the same work, proportionately, as he exercises skill and judgment in his driving.

Tire equipment will necessarily be one of the factors in the cost of operation. The pneumatic tire possesses many advantages, such as resiliency and traction; is less liable to skid and protects the machine against rough driving, but the ever present danger of a puncture or blow-out, often putting the machine out of commission to change or repair tires, and the expense of frequent replacements renders the pneumatic far from being the

ideal tire. The solid tire too has its advantages and disadvantages. The danger of punctures and blow-outs is entirely eliminated, and this equipment is durable and thoroughly reliable. With dual tires on the rear wheels, sufficient traction is obtained to carry the machine where you might reasonably expect to go, but the vibration to which your machine is subjected while being rapidly driven, especially over rough streets, necessitates many repairs and sooner or later sends the car to the shop for a general overhauling.

The cushion tire combines many of the good qualities of both the pneumatic and the solid, but does not possess the durability of the latter, and is correspondingly more expensive.

The actual cost of operating motor apparatus, exclusive of wear and tear and depreciation, is very small as compared with the horse-drawn machine. We have cars in service on which the cost of operation has averaged less than \$3 per month since their installation, which was nearly three years ago. We also have machines in service which during the last 18 months have not required one penny's worth of repairs.

The march of progress cannot be halted. Self-propelled fire apparatus, as the product of this progress, is rapidly making mighty inroads on the old methods of the fire fighting service. The growing favor of the motor car is in no way more concretely illustrated than in the recital of the fact that my home city, Birmingham, Ala., less than three years ago, with its 24 pieces of motor driven fire apparatus, ranked first as far as equipment of this kind in relation to population was concerned. But, today, what a change! With the same number of pieces in service she has dropped down to 36th.

This wonderful increase in the use of the new equipment is not due to a mere desire to get in line, to be more modern than our neighbor cities, but to far more substantial reasons. It has been brought about because it is more economical; because it is more sanitary; because immediately after our longest, hardest runs, it is ready to respond to the next call; because it will continue indefinitely without tiring.



## THE GASOLINE MOTOR PUMPING ENGINE.

(Extract from paper read by Charles S. Demarest, chief of construction, New York Fire Department, at the convention of the International Association of Fire Engineers in New York City.)

The motor pumping engine is yet a broad subject for discussion, but when we consider the standards set for it by the steam fire engine, which required a period of 60 years to bring it to its present state of perfection, we must all agree that the development of the motor pumping engine in the past two or three years has been wonderful. The New York department has so few pieces of motor pumping apparatus that actual service conditions will not be discussed to any large extent; however, experience with the large amount of other motor fire apparatus, and the rigid inspection of motor pumping engines made while taking part in tests of about every make on the market, have convinced the writer that the motor pumping engine cannot be classed, with its present design, as giving the same reliability as the steamer, although its performances in most every other respect have about equalled that of the steamer for the period of time during which they were run. We are all familiar with the performances and reliability of the steamer, and there is no reason in my mind why the motor pumping engine should not be just as reliable for fire service if the manufacturer would make a more exhaustive study of the conditions that actually exist at fires.

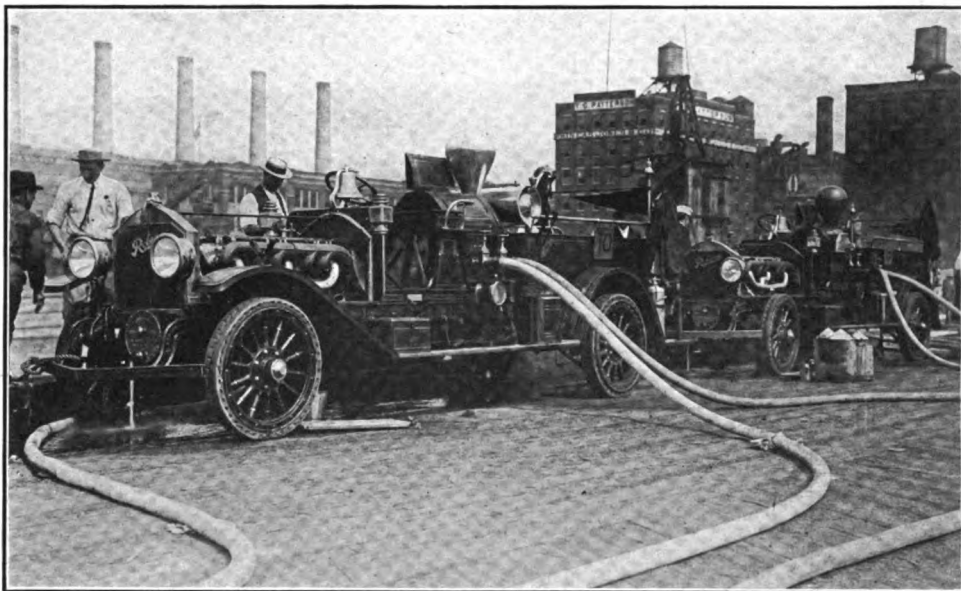
A motor behaves well in clear weather and many behave well on the road in a severe rain storm, but it has been our experience with several pieces of apparatus that they could not continue in service under conditions of rain and water liable to be encountered in fire service. Even with pleasure vehicles trouble is encountered; on July 28 of this year we had a severe rain storm which lasted for about one hour; during that storm, between 59th and 115th street, there were six automobiles that were stalled, due to the ignition systems not being water proof or not being properly protected against a severe rain storm.

It is not an unusual condition in fire service to have eight to 25 engines at work, with hose lines running on all sides and probably underneath fire apparatus; a burst hose near a pumping engine, a deflected stream from a nozzle or heavy spray may completely drench a motor. Now, is the motor pumping engine, its magneto, ignition system and carburetor, so well housed that it will continue to perform under such conditions? There is no reason why these important parts of the motor cannot be so housed that the chances of the motor going out of commission are very remote when hit with a stream of water. It may be possible that a motor must have a certain amount of air current while running on the road, but this does not apply when the motor is pumping water, as all motor pumping engines are so constructed that you may regulate the cooling water from the fire pumps.

Recently the motor for a water tower could not be started after several hours service at a fire; on investigation it was found the spark coil, one of the best on the market, had got wet and would not operate; the water in this case had worked through the front, indicating the need of not only water proofing all parts of the spark coil, but of housing the front in such a way that water

cannot reach it. If this had been a motor pumping engine it would have been put out of service, probably at the most critical stage of the fire.

Water proof magnetos are on the market, but do we get them on fire apparatus? Very few of the present makes are equipped with them, yet we learn of pumping engines failing at test because of water from leaky radiators being sprayed on them, and we know severe rains will put them out of service. Spark plugs, heated by long runs, have been known to have the porcelain insulation so badly cracked by water as to short circuit. The effect of water blowing into the carburetor would be serious, but no effort has been made to eliminate the danger and many are set in such a way as to invite water. It has been argued that because of the hood, the probability of water getting to these parts is very small. This cannot be accepted as a satisfactory statement with the present apparatus on the market; there is not today any motor pumping engine which can run for several hours without having to lift the hood to oil some moving part or refill an oil tank. In addition to having the above parts completely water proof, why should we not have



The Two Robinson Pumping Engines; Monarch in Front and Jumbo in Rear.

all other parts so designed as not to have the cover touched during a long run? The carburetor for fire service should have very few adjustments and these adjustments should not become disarranged or have to be changed after properly adjusting. The oiling system should be so designed and located that it would not be necessary to raise the engine hood for oiling purposes while working at a fire.

From the repair standpoint there should be borne in mind three very important factors: No apparatus should be bought which is too complicated for the chauffeur to make minor repairs, or for the foreman of the repair shops to take to pieces and put back again; no apparatus should be purchased which is so built that it is hard to get at its parts and requires a partial or total disassembling to make most repairs, and no machine should be constructed with its parts so heavy that they cannot be readily handled.

That these three features are not always followed is evident to anyone having to do with the repairing of many of those on the market. The cost of repairs in many cases is excessive, due to unnecessary complications. For example, in some apparatus it is necessary to take down the entire transmission and jackshaft housing in order to replace a jackshaft, but if the jackshaft were of the full floating type all this unnecessary labor



would be eliminated; in certain types, in order to get at the timing gears the entire motor has to be taken out; to put in a gasket on the exhaust manifold it should not be necessary to take down the steering column and dash; this is faulty construction and should be eliminated. A unit power plant is preferable, as it is not as liable to get out of line and is easier to handle when making repairs, as it can be taken out as a whole or can be taken apart.

The starting dog on the crankshaft should be keyed on as well as fastened with a pin; the shearing off of the pin, which has occurred in several cases where that was the only fastening, has resulted in serious injury to the timing gear.

Drip pans should be made more readily removable; in many instances it takes an hour or more to remove this when some minor repair is necessary.

The method of transmitting power from the motor to the pump should be positive in its action and there should be no chance of slippage between the motor and pump when increased pressures are required. Some recent accidents seem to indicate that the driver has gone from full speed ahead direct to reverse; this should not be possible, and usually a simple stop of some kind can be attached without changing the design of the shift.

The multiple disc clutch is unsatisfactory because of

the gasoline tank should be made of copper and of sufficient capacity to run the engine at full capacity for four or five hours, and gasoline supply to carburetor should be by the gravity system so the tank can be replenished without interrupting the motor. There should be no soldered joints in the gasoline line and this line should have a shut off close to tank and easily accessible, as well as a drain valve; the gasoline tank on pumping engines should have an arrangement whereby the operator can observe at all times the amount of gasoline in the tank.

The question of combined gasoline-electric drive is approached with limitation, as the manufacturers have gone to large expense in getting up this type of apparatus, presumably to meet the demands of fire chiefs. However, it is the writer's opinion that it is not the logical development and is certainly not desirable for the smaller places, where extensive shop facilities are not available and an electrician cannot be maintained. Besides increasing the first cost to a figure much beyond that for a tractor drawn piece of apparatus, it introduces the complications of extensive electric wiring; few men attached to repair shops can properly care for such apparatus and it is very unlikely that the operator will know even the first principles of maintenance of such apparatus.

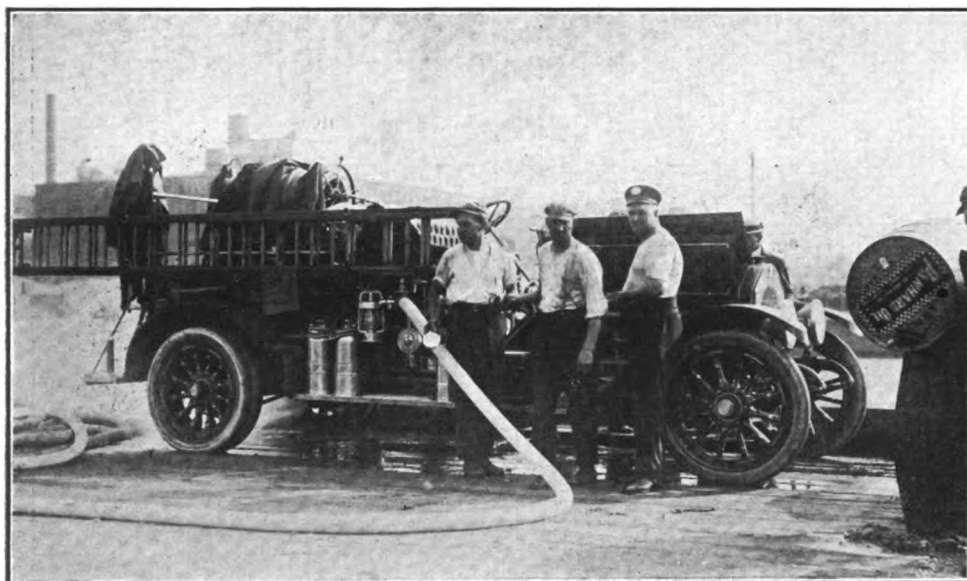
As a broad statement, resulting from experience with

all types of motor apparatus for fire service, it is evident that if the manufacturers do not pay more attention to their design as affecting reliability and ease of repair, it will be necessary for the fire chiefs to draw up more rigid specifications and detail drawings, which will require the manufacturers to modify their stock plans.

In buying motor fire apparatus a city, particularly a small or moderate one, should stick to one make that will give the desired results, or at any rate adopt certain things to be standardized and make all bidders put those things on according to your standard. If tractors are bought, they should be required to be interchangeable, the bolted connection, turntable, or whatever is used, to be the same in each. There is no reason why wheels,

axles, springs, brakes, carburetors, magnetos, batteries and spark plugs should not be standardized, thus cutting down the extra parts necessary to carry and make it easier to repair the apparatus; this will usually mean the employment of a mechanical draftsman to draw plans of these things, to be inserted in the specifications, but every up-to-date repair shop should have such a man, or should be able to employ one from the outside for the time needed. For the larger shops a graduate mechanical engineer, with about five years' experience, is almost a necessity; in our budget for next year we have asked for the creating of this position.

Continuing its policy of co-operating with the owner, the Willys-Overland Company, Toledo, O., maker of the Overland automobiles, has issued its annual book containing directions for the operation, care and adjustment of the new model 70, which is described in this issue. The book is considerably larger than its predecessor, which dealt with two models, and includes instructions as to the care of the electric lighting and motor starting system. Each component of the chassis is carefully explained and illustrated, and the directions for making adjustments are complete in each detail. The brochure appears in a durable dark green cover and the contents are indexed. One of the valuable features of the book is the lubrication chart.



The Smaller of the Two American-La France Machines in the Test.

the necessity of oiling and oiling just right; the cars so equipped in this department have given a great deal of trouble from these clutches being too dry and the gears being stripped when a change of speed was attempted. To oil and fix this type of clutch usually means putting the car out of service for quite a time and requires the removal of all hose on the apparatus. Although very satisfactory for touring car service, for fire service it should never be used.

Are the steering knuckles, cross steering tubes and their connections made of the best material and of sufficient strength to withstand fire service? With several makes of apparatus they have failed while responding to fires, and this failure is too serious to occur under even very severe conditions; the apparatus is out of service and probably sustains considerable damage, and, more important, the lives of the men are jeopardized. The wheel spindles, steering knuckles, cross steering tubes and their connections to the steering wheel should be stronger than on commercial apparatus, as the road conditions are more severe.

A heavy bumper should be provided on all fire apparatus, and it will more than pay for itself within a short time.

Besides the above, a study of accidents and repairs has brought out the following:

The oiling systems should be positive and reliable;



## GENERAL NEWS OF THE INDUSTRY.

### Palmer & Singer Manufacturing Company Announces Adoption of Magic Motor, Transmission and Wheel for 1914--New Buildings and Department Heads.

**A**T A special meeting of the board of directors of the Palmer & Singer Manufacturing Company, Long Island City, N. Y., held Aug. 27, Charles A. Singer, Sr., resigned as president to become first vice president. Clyde D. Knapp, who formerly held the office of first vice president, was promoted to the presidency. Incidentally, it is announced that demonstrating models of the Palmer-Singer car, equipped with Magic motor, transmission and demountable wheel, will be in the Broadway showrooms of Druet & Page, New York City agent, this fall, and that the company expects to be in a position to fill orders for these in the late spring, probably about June 1.

The change in officials has been made in order to permit Mr. Singer to devote his entire energy and valuable engineering knowledge to the engineering and production end of the company's business. Naturally, this will mean the development of the new motor, transmission and wheel as applied to the new Palmer-Singer models. The company recently acquired the right to manufacture these products, under license from the Motor & Gear Improvement Company, which owns outright the United States patents.

The Magic motor is termed a silent slide crescent valve engine, and was given extended tests by engineers of the industry in Detroit some months since. It is maintained by the Palmer & Singer Manufacturing Company that it will give greater power and efficiency with less vibration and at less cost than other types. The transmission is of the internal gear type, while the wheel has special quick demountable features which are expected to make a decided appeal to the owner.

#### MOON IN THE MIDDLE WEST.

#### New Manager and New Building for Headquarters in Chicago.

The growth of the business of the Moon Motor Car Company, St. Louis, Mo., in the Middle

West, under the management of E. N. Sanders, is best exemplified by the fact that the former quarters of the Moon Motor Car Company of Illinois at 2728 Michigan avenue, Chicago, have proved entirely inadequate. Accordingly, the company has acquired the former home of the Lozier Motor Company at 2612 Michigan avenue, where the new manager, Harry M. Newman, is now installed.

It may be added in this connection, that Mr. Sanders has been promoted to become western sales manager, having complete jurisdiction over the sale of Moon cars in the states lying west of the Rocky mountains. Like so many other successful salesmen in the automobile business, he is a graduate from the bicycle industry. He also



New Home of the Moon Motor Car Company of Illinois on Michigan Avenue, Chicago.

is an engineer of marked ability and previous to his appointment to the Chicago post, which embraces the states of Indiana, Michigan and Wisconsin, as well as northern Illinois, he became thoroughly familiar with every detail of Moon construction. He has been in charge of the Chicago office for the past four years, and prior to that period he was sales manager of the Centaur Motor Company of that city.

Mr. Newman has been associated with Mr. Sanders in building up the business in the Chicago territory. He became sales manager in March, going to the Moon company from the Washington Automobile Company, Washington, D. C., of which he also was sales manager. The branch, under his management, will occupy the



entire building shown in an accompanying illustration. The ground floor front will be occupied by the salesroom, while the rear will be fitted as a Moon garage and service station. The second floor front will be utilized as a showroom for used cars, and the rear for the storage of new machines.

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#### WITH ESTERLINE COMPANY.

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#### W. McK. White Leaves Marion Concern to Become Its Sales Manager.

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Some little surprise was occasioned last month by the announcement that W. McK. White had left the Marion Motor Car Company, Indianapolis, particularly as no statement was made



W. McK. White, Sales Manager, Esterline Company.

concerning his future plans. It transpires that he is to become sales manager for the Esterline Company, maker of electric lighting and starting equipment, which recently removed its plant from Lafayette to Indianapolis. It also is stated that this is the first move to be made by President J. W. Esterline in an effort to increase

considerably the scope of his company.

Mr. White has achieved a reputation among motorists and throughout the industry as an advertising man of prominence. During recent months he has been in the limelight, so to speak, because of his success as tour manager for the Indiana-Pacific tour of the Indiana Automobile Manufacturers' Association. He first came to Indianapolis four years ago, returned to New York for an intermediate year, and then assumed new duties in the Hoosier capital. His wide acquaintanceship among automobile manufacturers, representatives and owners will be of immense benefit to the Esterline Company.

It is stated that Mr. White will direct his attention largely to the distribution of the Golden

Glow lamps, as well as motor starters and complete lighting systems, while the electrical instrument business will be in charge of Mr. Hansell, as formerly.

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#### PROMOTION FOR E. A. SCHEU.

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#### Becomes General Manager and Sales Manager of Invader Oil Company.

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His many friends throughout the industry will be glad to learn that E. A. Scheu, Boston branch manager of the Invader Oil Company, has been promoted to become general manager and sales manager of the company with headquarters in New York City. In the near future he will make an extensive trip throughout the West for the purpose of visiting territorial distributors and appointing new agents.

Mr. Scheu was connected with the Packard Motor Car Company and its Boston agency from 1903 until 1908, when he became the first agent for Invader oils in that city. At that time, and until early in the present year, this business was owned and controlled by Chas. F. Kellom & Co., and Mr. Scheu was its Boston branch manager. When the Invader Oil Company was organized to take over this business he was retained in that position, and later became still more intimately connected with the company in a financial way.

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#### ASSUMES INCREASED RESPONSIBILITY.

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#### Chief Engineer Heaslet Becomes Studebaker's General Superintendent.

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While he will not release his position as chief engineer of the Studebaker Corporation, Detroit, James G. Heaslet has assumed additional responsibilities in accepting the appointment as general superintendent of the company's automobile plants. In this position he will receive direct reports from Production Manager Max Wollering, to whom the superintendents of the various plants in the system will make report.

The enlargement of Mr. Heaslet's responsibilities is directly in line with his Studebaker experiences, as he has at various times taken charge of Studebaker plants and directed manufacturing operations successfully. Of late, however, he has confined his activities to designing. It may be added that he is well known as a designer, having been with the Studebaker Corporation in this capacity for the past four years, and previous to that period with the Autocar, Garford and Rainier concerns.



**POPE HAS GOOD YEAR.****Maker of Pope-Hartford Line Seeks Additional Working Capital.**

The Pope Manufacturing Company, Hartford, Conn., recently announced its intention of devoting the entire time and attention of its pleasure car department to the production of six-cylinder models. This came somewhat in the nature of a surprise, since the maker of the Pope-Hartford line brought out a new four-cylinder machine only last year. The company also produces motor trucks, motorcycles and bicycles. Concerning the business of the past year the Wall Street Journal has the following to say:

The Pope Manufacturing Company, in its fiscal year to July 31, is understood to have made a gain in gross sales of about \$1,400,000, of which \$500,000 came from the bicycle and motorcycle end of the business, and the balance from automobiles. The chief attention of the management is at present concentrated on readjusting the company's finances, liquidating its bank loans and making suitable provision for the maturity next April of \$1,000,000 two-year six per cent. notes. In its last year the company produced a total of a trifle over 1000 automobiles and nearly 60,000 bicycles, the second largest bicycle output in its history.

This statement is of interest in connection with the report from Hartford, Conn., that the company is seeking to negotiate a 10-year mortgage loan of \$2,000,000, the avowed purpose being to have available more ready capital to replace temporarily the large sum which has been used in building up the business.

**DETROIT HOSPITAL PLAN.****Automobile Manufacturers in That City Have Formed Mutual Association.**

Because of the effect of the new employers' liability act now in force in Michigan, and the scarcity of hospital facilities in Detroit, 18 manufacturing concerns in that city have formed the Manufacturers and Mutual Hospital Association. A five-year lease on the Eaton homestead, 484 Jefferson avenue, has been taken and work is in progress toward equipping this for hospital purposes. There will be 24 beds, doctors' and directors' rooms, operating room and general reception room. It is anticipated that about \$25,000 a year will be expended in maintaining the institution.

The concerns forming the association include the following in the automobile industry: Detroit Screw Works, Morgan & Wright, Ireland & Matthews, Detroit Gear & Machine Company, Michigan Steel Castings Company, King Motor

Car Company and Michigan Bolt & Nut Works. Other motor car and accessory concerns are expected to join in the near future.

**A PIONEER ELECTRIC MAN.****Bee Becomes Vice President and General Sales Manager of Edison Company.**

The many friends of William G. Bee will be pleased to learn of his election as vice president and general sales manager of the Edison Storage Battery Company, Orange, N. J. By them it will be taken as a substantial recognition of his work in the electric vehicle end of the industry, and they will congratulate him upon his deserved promotion. Mr.

Bee has been connected with Thomas A. Edison for the past 11 years and has been identified with the automobile industry for 16 years. He entered the electric vehicle field in its earliest commercial stage, going with Col. Pope of Hartford, Conn., about the time of the organization of the Electric Vehicle Company in 1897.

At the beginning of the Spanish war, the following year, he was among the first to volunteer and served as chief gunner's mate on the U. S. S. Gloucester. Returning to the Hartford concern at the end of the war, he spent a year in Mexico in the interests of the company, and was in charge of its exhibit at the Pan-American exposition.

While with the Electric Vehicle Company, Mr. Bee gave Mr. Edison his first ride in an electric machine, this being the latter's first automobile experience. Since the perfection of the new Edison alkaline nickel-iron storage battery a few years ago, Mr. Bee has directed the sales policy, which is said to have resulted in supplying one-third of the batteries in electric truck service, with similar advances in pleasure cars.



William G. Bee, Vice President, Edison Storage Battery Company.



### **PURCHASES SEARCHLIGHT ASSETS.**

#### **Protective Committee the Only Bidder at the Receiver's Sale.**

But one bidder appeared at the receiver's sale of the assets of the Searchlight Gas Company, held in Warren, O., this being the Searchlight Protective Committee, which purchased the property for \$175,000. The committee is said to have been composed of a representation of the creditors and officials of the embarrassed corporation.

The property sold includes a 1.5-story building, about 50 by 100 feet, in Warren, and plants in Canton, O.; Chicago, Minneapolis, Bexar county, Texas, and Harrison, N. J. It was appraised at \$424,000 as a going concern, and was held to be worth \$350,000 as a non-going concern.

### **STEVENS-DURYEA EXPANDS.**

#### **Company Plans Large Additions to Plant Which Will Double Its Capacity.**

The Stevens-Duryea Company, Chicopee Falls, Mass., maker of Stevens-Duryea cars, will build large additions to its new plant at East Springfield, Mass. Work will begin at once, it is said, and many innovations will be made, one of which will be the construction of a half-mile testing track upon which the company's cars will be run, thus obviating the necessity of testing them upon the highways.

With the increase in space available when the additions are completed the company will be able to expand its several departments, which have hitherto been somewhat cramped for room. Whether or not the company will increase its production is not learned, but President Walter H. Whiteside states that the company will double its capacity by the new additions, which were contemplated over a year ago.

### **BUYS CUTTING PROPERTY.**

#### **Move Is Taken as an Indication That Business Will Be Reorganized.**

W. M. Thompson, president of the Jackson City Bank, Jackson, Mich., purchased the entire property of the Cutting Motor Car Company of that city at the recent receiver's sale, his bid being \$30,000 in cash. In addition, the purchaser agrees to assume two mortgages, which with accrued interest amount to about \$25,000.

Although there were about 20 automobile manufacturing firms, private individuals and other interested parties present, the bidding was somewhat slow. The move is taken as an indication that the company will be reorganized within the near future, and this is made somewhat more evident by the fact that plans for a 1914 model are well under way.

### **REMOVING TO DETROIT.**

#### **Sterling Motor Company of Flint, Mich., Takes Old Chevrolet Plant.**

The Sterling Motor Company, Flint, Mich., which recently came under the control of W. C. Little, formerly of the Chevrolet and Little car companies, has removed to Detroit, where it will occupy the plant vacated by the Chevrolet concern. The Sterling company manufactures motors, and the new move will give it some 60,000 feet of floor space, where about 500 men will be employed.

Mr. Little also announces that cyclecar engines will be added to the line already produced by the company. No definite specifications are available at this time. It is understood that beyond assuming the position of general manager, Mr. Little will make no changes in the official personnel at present.

### **AMERICAN CYCLECAR COMPANY.**

#### **Connecticut Electric Manufacturing Company Will Not Change the Name.**

Following preparatory work, which has been carried on in a quiet way for some months, since the incorporation of the American Cyclecar Company, Detroit, comes the announcement that the concern has been purchased by the Connecticut Electric Manufacturing Company, Bridgeport, Conn., which will not, however, change the name of the corporation. Coincident with the transfer of the property, the capitalization was increased from \$1000 to \$200,000. The present officials are: President, A. H. Trumbull; vice president, Harry J. Stoops; secretary and treasurer, I. B. Trumbull.

It is understood that offices will be retained in Detroit, although it is probable that the car will be manufactured in the East. According to an official statement, the machine will have a four-cylinder, water-cooled motor, with bore of 2.875 inches and stroke of four. The wheelbase will be



80 inches and the tread 44. The body will accommodate two persons, seated side by side.

### SECURES HIS OLD PLANT.

#### E. R. Thomas Recovers Possession of Factory Buildings in Buffalo, N. Y.

E. R. Thomas, Buffalo, N. Y., for a number of years prominently identified with the automobile industry in the production of the Thomas car, has purchased the building at 1192 Niagara street, that city, formerly occupied by the E. R. Thomas Motor Car Company. The move was responsible for a number of rumors, having as their basis that he was about to re-enter the industry, either through the production of a light weight motor car or a cyclecar.

Mr. Thomas has seen fit to deny these rumors, explaining that he purchased the property in order that it might not be transformed for tenement or business purposes. He is fitting it for light manufacturing of any kind, although it is explained that it would be available for the production of automobiles without much change.

### TO INCREASE CAPITAL STOCK.

#### Swinehart Tire & Rubber Company Plans a Total Issue of \$1,000,000.

The Swinehart Tire & Rubber Company, Akron, O., maker of Swinehart tires, announces that steps will be taken at the annual meeting for an increase in the capital stock of the company, from \$800,000 to \$1,000,000. In financial circles it is considered probable that the new issue will be preferred stock, although the notice of the contemplated action does not state what form the new financing will take.

The annual meeting has been called for Sept. 24 at the company's general offices at Akron. At this meeting the directors will recommend that the shareholders take the necessary steps to increase the capital. It is probable that the form of new issue will be decided at that time.

### ANOTHER NEW CAR COMING.

#### MacKaye Leaves Keeton Company to Organize Concern for Its Production.

H. D. W. MacKaye, a veteran of the automobile industry, has severed his connection with the Keeton Motor Company, Detroit, maker of Keeton cars, with which concern he was assist-

ant to the president. Mr. MacKaye is the principal figure around which has been organized a new automobile company which will manufacture a car to list for less than \$500.

It is said that the concern has been in process of organization for the past year, engineers having been at work upon the models to be made and other details being worked out. A three-passenger roadster and four-passenger touring car will be built, and it is announced that these will follow so-called French designs.

### MRS. MEIROWSKY GOES ABROAD.

#### Well Known Advertising Manager to Combine Business with Pleasure.

Mrs. Oscar Meirowsky, who as Miss Dorothy Kane was well known in the industry through her connection with the advertising department of the Abbott Motor Company, Detroit, maker of Abbott-Detroit cars, sailed recently for Hamburg, Germany, where she will enjoy a vacation tour of Germany, France and England. Since her marriage, Mrs. Merrowsky has been advertising and publicity manager of the Abbott-Detroit Motor Company, New York City, distributor for this line.



Mrs. Oscar Meirowsky, Advertising and Publicity Manager.

While the European trip has been undertaken primarily as a much needed rest, it will result in the compilation of a route book and general guide for the use of Abbott-Detroit owners. In addition, Mrs. Meirowsky will make a special study of equipment for touring automobiles, a department to which, in her opinion, American manufacturers will do well to pay more attention than in the past.

The dealers in Atlanta, Ga., have decided upon Nov. 8-15 as the dates for the annual Auditorium show in that city.



# MOUNTAIN ROADS OF PENNSYLVANIA.

**An Itinerary Which Takes the Tourist Through the Anthracite Coal Regions, and Visits Many Historic Scenes Both Going and Returning.**

**W**HILE many of the mountain roads of eastern Pennsylvania offer a strong contrast to the touring conditions available in New England, the owner of the modern car does not hesitate to visit country which presents interesting views. It cannot be denied that the district covered by the first portion of the itinerary listed as No. 58 is plentifully supplied with natural beauties, and the section of New Jersey visited offers good roads.

After leaving Philadelphia by way of Fairmount park and passing through Bryn Mawr, the seat of Bryn Mawr College for girls,

Harrisburg from this point is considered the most practical, although the frequent stops at toll gates detract somewhat from the pleasure of the trip.

Harrisburg was made the capital of Pennsylvania in 1812. It is located on the eastern bank of the Susquehanna, which at this point is about a mile wide. The State House is prominently situated on a hill, and was rebuilt recently at a cost approximating \$13,000,000. In Harris park is to be found the stump of a tree to which John Harris, after whom the city is named, was tied by Indians with the intention of burning him

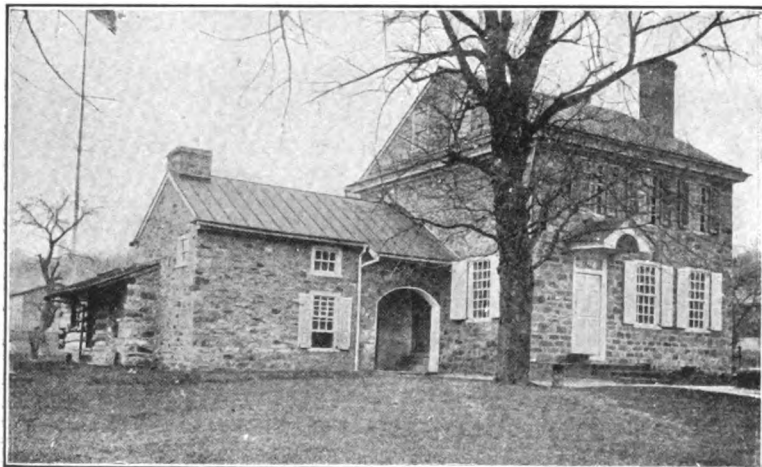
many Wilkesbarre people have their summer homes on its shores. The elevation is 2200 feet, and the lake itself is shut in by rocks and hills, which with the pristine freshness of the woods make it an ideal spot at any season of the year.

Leaving Eagles Mere, the route is well defined, since it is used almost constantly during the summer by motorists from Wilkesbarre who frequently make the trip between their summer homes and their places of business. Upon reaching Nanticoke, the Wyoming valley is followed into Wilkesbarre, in the centre of the coal mining country.

Wilkesbarre was founded in 1772 and named in honor of the two chief partisans of American liberty in the British Parliament. Wyoming valley, of which it is the metropolis, was the Indian Maughwauwama, meaning large plain, and is about three miles wide and 20 long, enclosed by two parallel mountain ranges from 800 to 1100 feet high. The tour enters it through the Nanticoke gap and leaves through the Lackawanna gap.

The entire distance between Wilkesbarre and Scranton lies in the heart of the anthracite coal district, and is marked by collieries and villages of foreign workmen. Nowhere else in America is it possible to study this phase of mining to better advantage. From the driver's point of view the conditions are by no means ideal, since there are many branch railroads and spur tracks, necessitating extreme caution. In addition, the village streets are very narrow and children and animals roam at will.

The route from Scranton to Delaware Water Gap is over the Pocono range, and is one which is followed annually by thousands of motorists. The first portion involves a steady climb up the western slope of the Alleghenys to Tobyhanna. Then follows Mt. Pocono with its numerous sum-



**Washington's Headquarters at Valley Forge, as It Appears Today.**

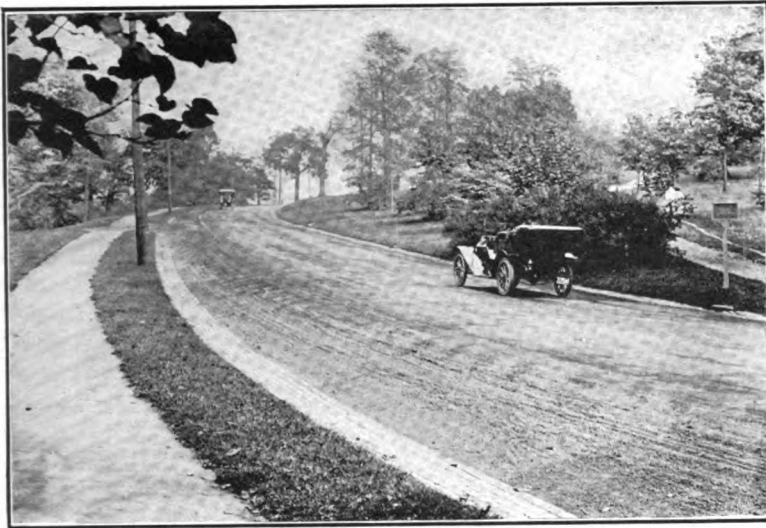
the tourist has opportunity to visit Valley Forge, famous as Washington's headquarters during the winter of 1778-9. The old farm house which he occupied is still standing, and the entire camp has been reserved as a public park.

Near Pottstown is an interesting group of stones known as the "Ringing Rocks," which emit a peculiar ringing sound when struck. The drive between this city and Reading is replete with splendid views, and near the latter city are two mountains of more than passing interest, Penn and Neversink. The route to

alive. The Pennsylvania railroad's stone arch bridge across the river is said to be the longest in the world.

The road leading from Harrisburg to Eagles Mere follows the Susquehanna river for many miles, affording many rich river and mountain views. In places the way is rough and stony, and at some points caution must be used in crossing the railroad tracks. At Muncy the route turns into the hills for a picturesque drive into the virgin forest about Eagles Mere, or the Lake of the Eagles. This is a favorite spot for fishermen and hunters, and





One of the Interesting Automobile Drives Seen in Fairmount Park, Philadelphia.

mer hotels, and the long descent of Pocono mountain into the valley of Broadheads creek and Stroudsburg. After leaving Stroudsburg the route crosses Mt. Michaels creek, descends Godfrey ridge, and follows Cherry Creek valley to the gap.

The Delaware river is crossed on an old fashioned flat boat attached to a cable, then the valley of the Musconetcong in New Jersey is followed into Hacketts-town. After leaving that city there is a steep grade up Schooleys mountain, but the road has been placed in such condition that little difficulty is experienced. At the summit is a well known summer resort, overlooking the Musconetcong and German valleys, and it is stated that Washington spent a part of a season there in 1793. Good macadam roads take the tourist into Morristown, Washington's winter quarters in 1779-80. The house occupied by him is now maintained as a historical museum.

The night stop is at Elizabeth, within easy access of New York City. Near Freehold may be seen the monument commemorating the battle of Monmouth, June 28, 1778, in which Gen. Lafayette played such an important part in the routing of the British army. Lakewood is one of the most popular summer and winter resorts in the North. Situated amid the pines of New Jersey, near the coast, there are many pretty

walks and drives through the woods, as well as two picturesque lakes, Caysaljo and Maneta.

Following the main route from Lakewood to Atlantic City for a time, the way leads through several of the Jersey coast towns to New Gretna, after which it enters the rich market gardening district of which Hammonton is the centre. The tour passes through the outskirts of Hammonton, at which point a pleasant little side trip to Hammonton lake may be made. The remainder of the distance is with market gardens on

either side, until almost within the city of Camden, where the ferry into Philadelphia is reached.

### ITINERARY NO. 58.

Night Stops—Philadelphia, Harrisburg, Eagles Mere and Scranton, Penn.; Elizabeth, N. J. Five Days, 559.1 Miles.

Philadelphia-Harrisburg, 111.1 Miles.

|                           | Miles to | Total Miles |
|---------------------------|----------|-------------|
|                           | Out      | Return      |
| Philadelphia . . . . .    | 0.0      | 0.0         |
| Ardmore . . . . .         | 9.4      | 101.7       |
| Bryn Mawr . . . . .       | 2.1      | 99.6        |
| Swedeland . . . . .       | 6.2      | 93.4        |
| Bridgeport . . . . .      | 2.0      | 91.4        |
| Norristown . . . . .      | 1.0      | 90.4        |
| Collegeville . . . . .    | 7.8      | 82.6        |
| Trappe . . . . .          | 1.9      | 80.7        |
| Limerick . . . . .        | 3.0      | 77.7        |
| Sanatoga . . . . .        | 4.3      | 73.4        |
| Pottstown . . . . .       | 2.7      | 70.7        |
| Douglasville . . . . .    | 4.5      | 66.2        |
| Weavertown . . . . .      | 3.0      | 63.2        |
| Stonerville . . . . .     | 2.7      | 60.5        |
| Reading . . . . .         | 7.5      | 53.0        |
| Sinking Springs . . . . . | 4.9      | 48.1        |
| Wernersville . . . . .    | 3.3      | 44.8        |
| Robesonia . . . . .       | 3.3      | 41.5        |
| Wormelsdorf . . . . .     | 2.9      | 38.6        |
| Waterloo . . . . .        | 2.8      | 35.8        |
| Myerstown . . . . .       | 4.0      | 31.8        |
| Avon . . . . .            | 5.0      | 26.8        |
| Lebanon . . . . .         | 1.5      | 25.3        |
| Annaville . . . . .       | 4.8      | 20.5        |
| Palmyra . . . . .         | 4.5      | 16.0        |
| Swatara . . . . .         | 4.0      | 12.0        |
| Hummelstown . . . . .     | 2.5      | 9.5         |
| Harrisburg . . . . .      | 9.5      | 0.0         |



Pleasant Combination of River and Mountain Views, Characteristic of Eastern Pennsylvania.



Harrisburg-Eagles Mere, 106.7 Miles.

|                    | Miles to | Total Miles |
|--------------------|----------|-------------|
|                    | Out      | Return      |
| Harrisburg         | 0.0      | 106.7       |
| Fort Hunter        | 6.5      | 100.2       |
| Dauphin            | 2.0      | 98.2        |
| Clark's Ferry      | 6.0      | 92.2        |
| New Buffalo        | 5.2      | 87.0        |
| Mt. Patrick        | 6.4      | 80.6        |
| Liverpool          | 3.5      | 77.1        |
| McKee's Half Falls | 7.5      | 69.6        |

Eagles Mere-Scranton, 76.8 Miles.

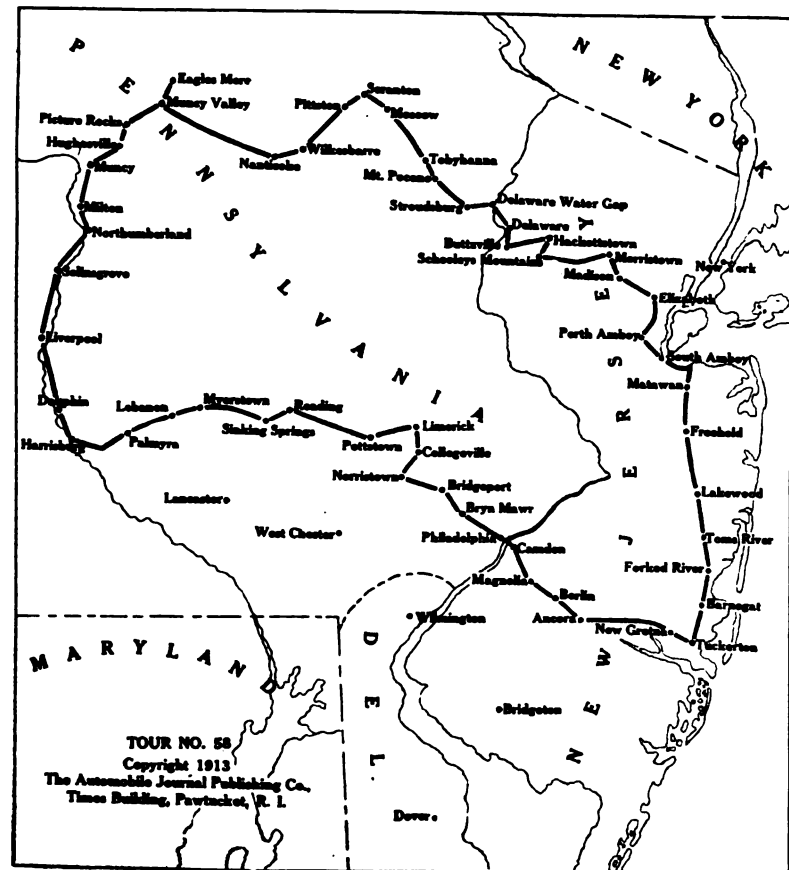
|                | Miles to | Total Miles |
|----------------|----------|-------------|
|                | Out      | Return      |
| Eagles Mere    | 0.0      | 76.8        |
| Muncy Valley   | 7.0      | 69.8        |
| Beach Glen     | 1.5      | 68.3        |
| North Mountain | 3.7      | 64.6        |
| Lungerville    | 2.5      | 62.1        |
| Guava          | 8.6      | 53.5        |
| Laubach        | 2.4      | 51.1        |
| Coles Mill     | 2.0      | 49.1        |

Scranton-Elizabeth, 120.2 Miles.

|                     | Miles to | Total Miles |
|---------------------|----------|-------------|
|                     | Out      | Return      |
| Scranton            | 0.0      | 120.2       |
| Elmhurst            | 8.5      | 111.7       |
| Moscow              | 3.3      | 108.4       |
| Gouldsboro          | 10.3     | 98.1        |
| Tobyhanna           | 5.6      | 92.5        |
| Mt. Pocono          | 5.1      | 87.4        |
| Paradise            | 4.1      | 83.3        |
| Henryville          | 2.8      | 80.5        |
| Analomink           | 4.1      | 76.4        |
| Stroudsburg         | 5.2      | 71.2        |
| Delaware Water Gap  | 3.7      | 67.5        |
| Portland            | 5.3      | 62.2        |
| Myers Ferry         | 2.9      | 59.3        |
| Delaware, N. J.     | 0.4      | 58.9        |
| Bridgeville         | 5.6      | 53.3        |
| Buttsville          | 1.2      | 52.1        |
| Pequest             | 1.7      | 50.4        |
| Townsbury           | 2.2      | 48.2        |
| Danville            | 2.5      | 45.7        |
| Great Meadow        | 0.5      | 45.2        |
| Vienna              | 1.0      | 44.2        |
| Hackettstown        | 3.9      | 40.3        |
| Schooleys Mountains | 3.5      | 36.8        |
| German Valley       | 2.7      | 34.1        |
| Chester             | 4.8      | 29.3        |
| Mendham             | 5.5      | 23.8        |
| Morristown          | 7.0      | 16.8        |
| Madison             | 4.5      | 12.3        |
| Springfield         | 6.5      | 5.8         |
| Elizabeth           | 5.8      | 0.0         |

Elizabeth - Philadelphia, 144.3 Miles.

|                | Miles to | Total Miles |
|----------------|----------|-------------|
|                | Out      | Return      |
| Elizabeth      | 0.0      | 144.3       |
| Rahway         | 5.5      | 138.8       |
| Perth Amboy    | 7.5      | 131.3       |
| South Amboy    | 3.3      | 128.0       |
| Morgan Station | 2.5      | 125.5       |
| Keyport        | 3.9      | 121.6       |
| Matawan        | 2.0      | 119.6       |
| Freneau        | 0.5      | 119.1       |
| Wickatunk      | 2.0      | 117.1       |
| Marlboro       | 4.8      | 112.3       |
| Freehold       | 4.0      | 108.3       |
| Adelphia       | 3.5      | 104.8       |
| Lakewood       | 9.0      | 95.8        |
| Toms River     | 9.8      | 86.0        |
| Forked River   | 9.3      | 76.7        |
| Waretown       | 3.8      | 72.9        |
| Barnegat       | 1.8      | 71.1        |
| Manahawken     | 4.3      | 66.8        |
| West Creek     | 4.9      | 61.9        |
| Parkerton      | 0.7      | 61.2        |
| Tuckerton      | 2.2      | 59.0        |
| New Gretna     | 6.1      | 52.9        |
| Wading River   | 4.0      | 48.9        |
| Green Bank     | 6.5      | 42.4        |
| Batsto         | 4.2      | 38.2        |
| Nesco          | 3.0      | 35.2        |
| Ancora         | 9.9      | 25.3        |
| Berlin         | 8.3      | 17.0        |
| Overbrook      | 4.0      | 13.0        |
| Magnolia       | 3.0      | 10.0        |
| Haddon Heights | 3.0      | 7.0         |
| Camden         | 5.0      | 2.0         |
| Philadelphia   | 2.0      | 0.0         |



|                |      |       |      |
|----------------|------|-------|------|
| Independence   | 2.0  | 39.1  | 67.6 |
| Chapman        | 1.4  | 40.5  | 66.2 |
| Port Trevorton | 1.5  | 42.0  | 64.7 |
| Sellingsgrove  | 4.7  | 46.7  | 60.0 |
| Shamokin Dam   | 6.0  | 52.7  | 54.0 |
| Northumberland | 3.0  | 55.7  | 51.0 |
| Milton         | 11.3 | 67.0  | 39.7 |
| McEwensville   | 4.5  | 71.5  | 35.2 |
| Muncy          | 9.7  | 81.2  | 25.5 |
| Hughesville    | 4.5  | 85.7  | 21.0 |
| Picture Rocks  | 2.7  | 88.4  | 18.3 |
| Tivoli         | 0.8  | 89.2  | 17.5 |
| Muncy Valley   | 10.5 | 99.7  | 7.0  |
| Eagles Mere    | 7.0  | 106.7 | 0.0  |

|               |     |      |      |
|---------------|-----|------|------|
| Fairmount     | 3.5 | 31.2 | 45.6 |
| Springs       | 4.6 | 35.8 | 41.0 |
| Harveyville   | 5.2 | 41.0 | 35.8 |
| Muhlenburg    | 6.0 | 47.0 | 29.8 |
| Harvey Creek  | 3.0 | 50.0 | 26.8 |
| Nanticoke     | 1.5 | 51.5 | 25.3 |
| Wilkesbarre   | 7.5 | 59.0 | 17.8 |
| Pittston      | 7.5 | 66.5 | 10.3 |
| Duryea        | 2.8 | 69.3 | 7.5  |
| Old Forge     | 1.2 | 70.5 | 6.3  |
| Taylor        | 2.5 | 73.0 | 3.8  |
| West Scranton | 2.7 | 75.7 | 1.1  |
| Scranton      | 1.1 | 76.8 | 0.0  |

The Massachusetts state highway commission is making its first test of concrete road surface in North Andover, where about 1.5 miles of this pavement has been laid this year. An additional contract for two more miles has recently been awarded. The road

surface is 18 feet wide, with a substantial shoulder of three feet on either side. It is explained that it is laid in much the same manner as a granolithic sidewalk, except that the finish is not quite so smooth. Someone between Norwich and

Willimantic, Conn., has adopted a novel method of calling attention to a dangerous railroad crossing, having posted a sign reading as follows: "Danger! This railroad crossing is a well designed death trap and is a disgrace to the State of Connecticut."



## VULCAN CHASSIS IS WELL CONSTRUCTED.

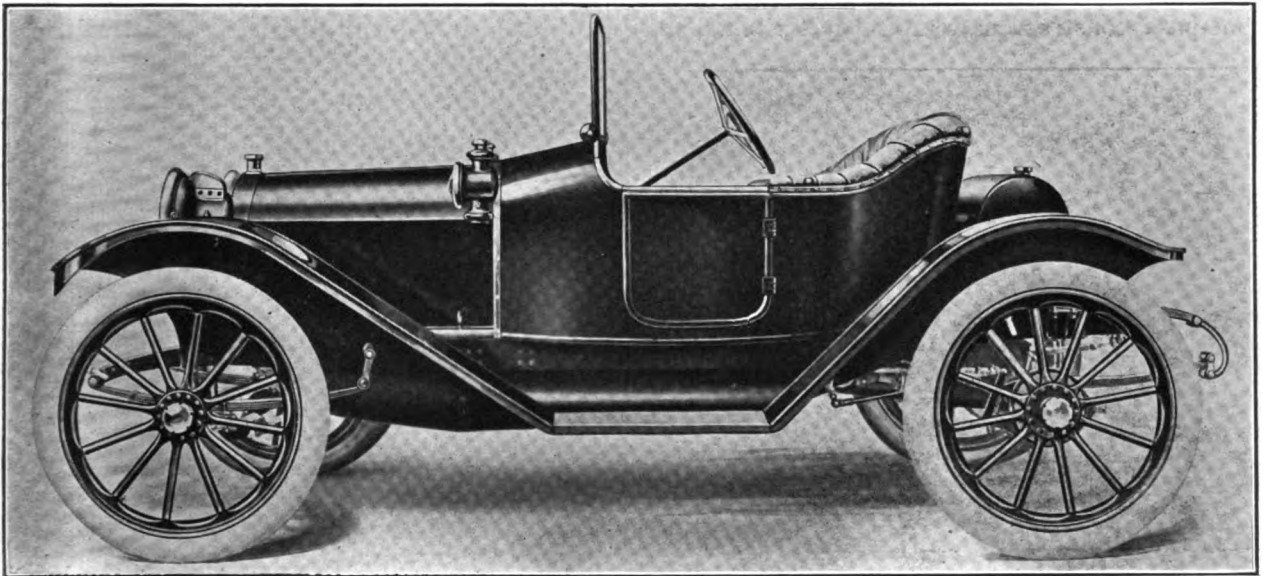
**B**ELIEVING that the interests of the agent and prospective purchaser would be best served by not making public the details and price of its product until ready to make actual deliveries, the Vulcan Manufacturing Company, Painesville, O., has delayed its announcement of the Vulcan "27," a popular priced, light weight car, which will be constructed in one chassis having two body styles. These include a two-passenger speedster and a five-passenger touring car, the chassis of the latter differing only in the frame, wheelbase and springs.

Since its inception the efforts of the company have been centred on the production of a simple,

gauges, the master being held at the inspection department and the service being used by the machinists.

Every piece of material which enters into the machine is carefully selected and tested, and drop forgings are utilized wherever possible. Where strength and lightness are desired, pressed steel is employed, and the material is carefully analyzed. All castings used in the Vulcan are made in the company's foundry, which is equipped to produce castings free from blow holes or chilled spots.

The Vulcan motor is of the four-cylinder, L head type, with the cylinders cast en bloc, and it



**Vulcan "27" Speedster Model Has Attractive Lines and Is Built Completely in the Factories of the Vulcan Manufacturing Company.**

durable design, one having ample power to meet the requirements of every day service, capable of being maintained at a minimum cost, and possible to manufacture economically and in quantity to permit a low selling price. All parts and units entering into the construction of the Vulcan are manufactured in the factories of the concern and it has taken several years to equip the plant with the special machinery, dies, jigs and tools necessary for an economical production. The mechanical engineers are men of wide experience in the automobile industry, and the Vulcan shows the result of careful designing, in that the number of parts is reduced to a minimum and each is interchangeable. Every part must pass through a set of limit gauges, which insures accuracy and uniformity, and there are two sets of these

will be noted by accompanying illustrations that it is very simple in design as well as compact. The bore is 3.375 inches and stroke five, which places it in the long stroke class, and the dimensions should make for economy of fuel, also efficiency at low speeds. Although rated at 27 horsepower, this is stated to be conservative, it having developed considerably in excess of this rating in dynamometer tests. The components of the power plant are liberally proportioned throughout. The usual pan or shield is provided. The crankshaft is a heavy drop forging with the flywheel flange forged integral, and is carried in bearings 1.875 inches in diameter. These are extra long, the rear member being 5.5 inches. Both main and connecting rod bearings are fitted with heavy boxes, die cast from non-friction



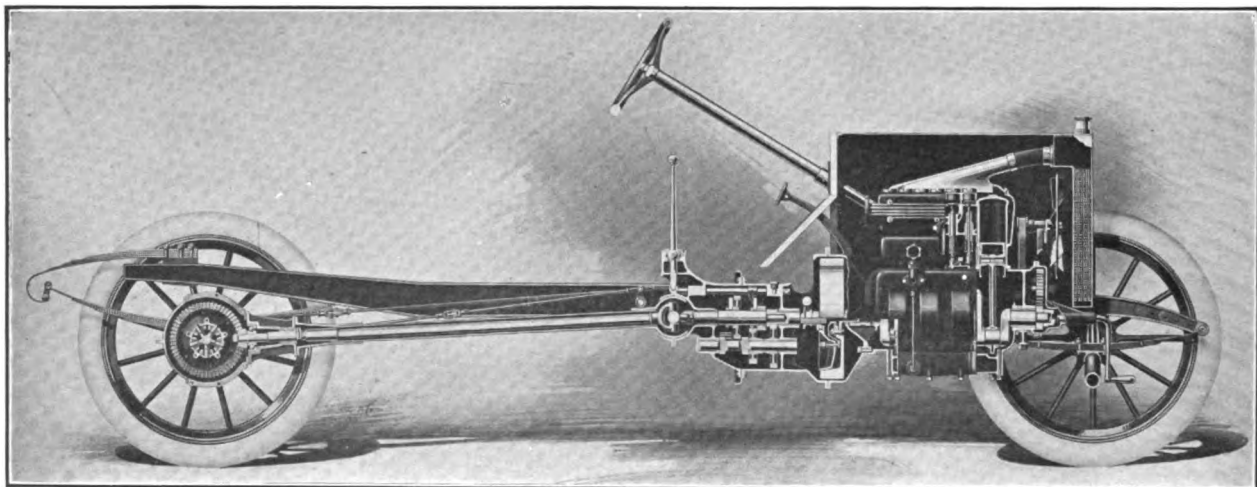
white bronze, a metal of great durability. The connecting rods and pistons are very long, the latter having three rings above the wristpin and their design is such that they should be lubricated easily, and the oil should be prevented from working into the combustion chamber. The connecting rods are of the split type and are fitted with an oil scoop.

The camshaft is a solid drop forging with integral cams, and is supported at the centre by a wide bearing, eliminating the possibility of springing. All cams are integral and their surfaces are ground true after hardening. The valves, which are located on the right, are 1.625 inches in diameter and are enclosed by a single plate retained by two hand screws. They are very accessible and means are provided for adjustment. The exhaust manifold is a straight one-piece construction, retained by six bolts, and

crankcase. It is positively driven, the same gear actuating the fan pulley shaft.

The lubrication system is a combination of the positive feed and constant level splash type. A plunger pump forces the oil from a six-quart reservoir in the lower crankcase to all bearings and gears, and maintains a predetermined level in the crankcase, into which the ends of the connecting rods dip, splashing lubricant to the working parts. The supply is noted easily by a float gauge at the base of the motor.

The design of the motor and its liberal sized water jackets, outlet and inlet pipes, favor thermo-syphon cooling. The cooled fluid enters at the lower left hand side of the motor and circulates around the valves and head, passing out through a one-piece outlet manifold to a large capacity vertical tube type radiator. Cooling is further aided by a ball bearing 12-inch fan, driven



**Sectional View of Vulcan Chassis, Showing Sturdy and Well Designed Components, Also Unit Power Plant and Low Centre of Gravity.**

its proximity to the well designed intake manifold facilitates carburetion. The exhaust manifold is ribbed to facilitate radiation of heat, which, with an exhaust pipe of large diameter, reduces back pressure to a minimum.

Vaporization of the fuel is aided by hot air, a short flexible tube connecting the air intake with the exhaust manifold. Feed is by gravity, the high position of the tank insuring a maximum flow even when ascending the steepest grade. The fuel tank of the roadster is 12 inches in diameter and 30 long, of round construction, with dished ends and made of heavy gauge, lead coated steel. The joints are lap seamed and soldered, and the container is designed to be leak proof.

Ignition is by a true high-tension magneto located on the left hand side of the motor and mounted on a bracket cast integral with the

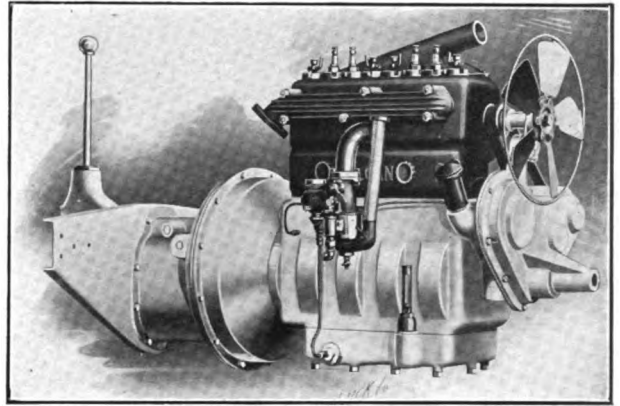
by a flat belt and having means for adjustment. The timing gears are carefully cut, insuring quiet operation, and are accessible. Throughout, the power plant is noticeable for simplicity and a small number of exterior parts. Extreme care is taken in the assembly and testing, and the inspection is very thorough.

The motor, clutch and transmission are a unit and the method of mounting differs from conventional practise. The three point suspension is utilized, but the rear cross member is bolted through the centre of the transmission case. This support is liberal in size and is sufficiently sturdy to resist the torsional and thrusting strains of operating over rough and uneven roads. The clutch is of the cone type, 13 inches in diameter, having a facing of leather 1.5 inches wide. Pressure is maintained by eight expanding spiral



springs pressing against the aluminum clutch wheel at one end, and a pressed steel spring spider at the other. Release is effected by a pedal operated yoke, and so easy is the clutch in its action that it can be disengaged by a slight pressure, a factor which will appeal to women drivers. The yoke is provided with tapered roller bearings, which engage in a deep groove in the clutch wheel hub. The clutch wheel is mounted on ball bearings, and the mechanism is fully enclosed but easily accessible through a large inspection plate at the top of the housing.

The transmission is of the selective type, three speeds forward and reverse, and the low gear is such as to make starting easy and gradual. It is also of value in operating over bad and hilly roads, etc. The gears are of a 3.5 per cent. nickel steel, carefully heat treated, and the teeth are



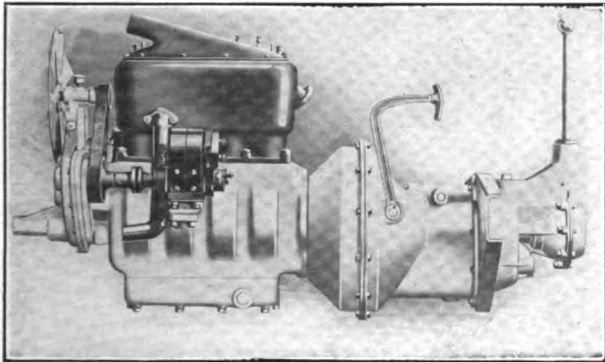
**The Vulcan Motor is Noticeable for its Simplicity and Compactness—It is Carried on a Three Point Suspension.**

tively avoided in the Vulcan universal joint.

The rear axle is of the semi-floating type, the weight of the car being sustained by large ball bearings mounted on the tubular housing. All ball bearings utilized in connection with the transmission of the power to the rear axle are oversize, making for durability.

The main driving gear is machined from a solid drop forged ring of 3.5 per cent. nickel steel, and the pinion from a solid bar of the same material. The teeth, which are extra large, being 1.25-inch face, are planed with a Gleason gear tooth generator, insuring accurate proportions. The teeth on the driving pinion are reinforced by an added brace extending back .375-inch beyond the tooth on the gear hub. All gears are carefully heat treated and hardened. A large New Departure self-contained ball bearing is utilized immediately back of the driving pinion. The axles are 1.1875 inches in diameter.

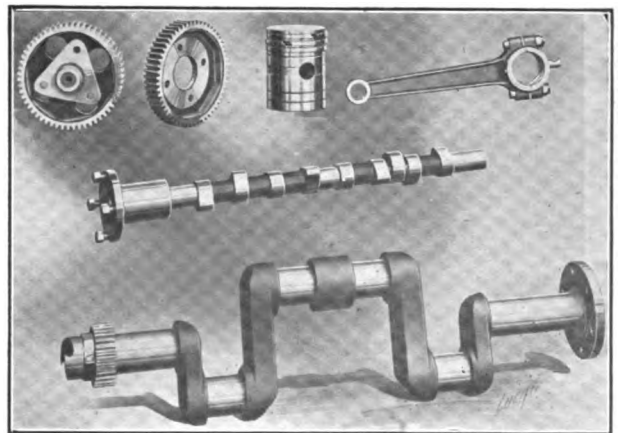
The gear type of differential is employed, but differs from conventional design in that five pin-



**Magneto Side of Vulcan Motor, Showing Enclosed Fly-wheel and Method of Bolting Cross Member to Transmission Housing.**

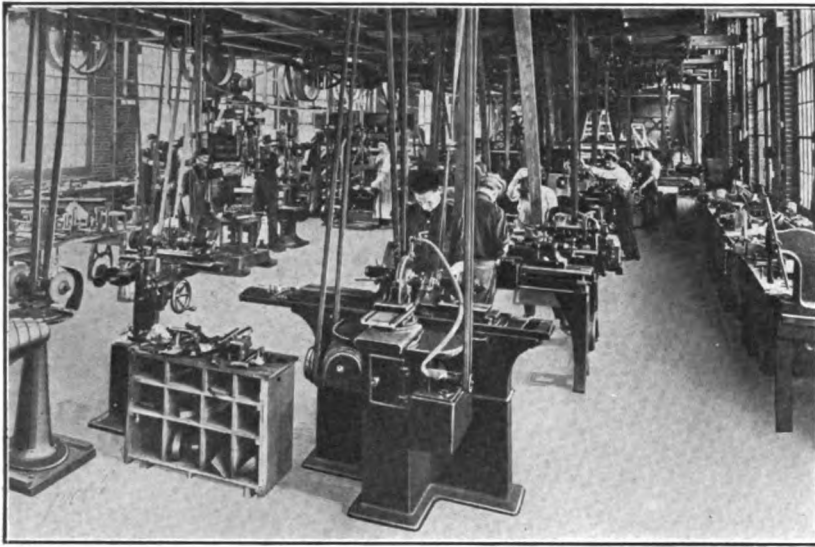
wide, being from .75 to 1.125 inches. The engaging gears are chamfered by special machinery, making for quiet engagement and operation. The change speed lever is set in a ball and socket below which is the H cast in the transmission housing, and the lever is of the cane handle type, surmounted by an aluminum ball conforming to the shape of the palm of the hand.

Drive is by shaft through a torsion tube. The front half of the universal joint housing is cast integral with the rear half of the transmission case, forming, with the pressed steel cap bolted to it, the socket for the ball. The last named is of drawn steel, pressed and riveted to the end of the torsion tube. The hollow ball and socket forms a grease tight housing for the universal joint and also transmits the energy of the motor to the rear axle. The two yokes and centre piece constituting the universal joint are heavy drop forgings having large bearings. The maker lays great emphasis on the construction, stating that lost motion after considerable service is posi-



**Indicating the Liberal Proportions of Some of the Working Parts of the Vulcan Motor—Note the Size of the Main Bearings of the Crankshaft.**





**A Section of the Vulcan Tool Room Where Special Tools, Dies, Jigs, Etc., Are Constructed.**

ions are utilized, a construction making for great strength and durability. The pinions are of nickel steel, phosphor bronze bushed, and revolve on a drop forged spider. The bearings are 4.0625 inches in diameter and .625-inch balls are used. The rear axle housing is liberally ribbed and a large inspection plate is easily removed. The wheels are grade A, second growth kiln dried hickory, 12 spokes to a wheel, with malleable iron hubs. Ball bearings are employed, .625-inch balls being fitted to the inner bearings and .5-inch on the outer.

The front axle is tubular, with the usual drop in the centre. The steering knuckles, levers and yokes are extra large, providing a large factor of safety, the knuckles being 1.375 inches in diameter. All are drop froged from a special alloy steel, selected for its great tensile strength. The method of attaching the steering lever to the knuckle is such that the car can be turned in a circle 30 feet in diameter. The clearance under the centre of the front axle is 10.5 inches.

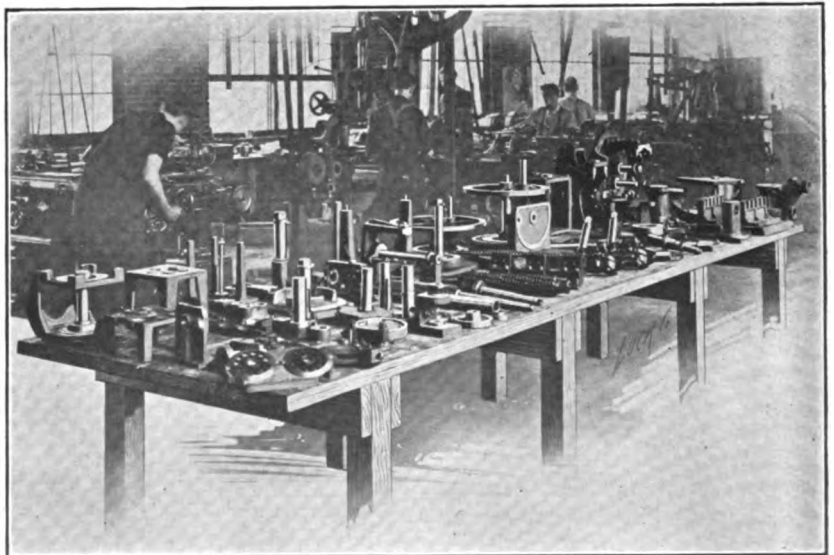
The steering gear is of the rack and pinion type and the dimensions of the parts are such that there is a large factor of safety. The company points out that this type of gear makes for easy steering on the roughest of roads with a minimum of effort. The column is set at a comfort-

able angle, one bringing the 16-inch wheel convenient to the operator. The pinion end of the column is hung to the front cross member just to the rear of the front axle, a location eliminating surplus rods, bell cranks, etc. The front wheels are slightly dished, bringing the point of tire contact in a direct vertical line with the steering knuckle pivot, aiding in steering and reducing road shocks.

The brakes are ample in size and the leverage is so arranged that a gentle pressure is sufficient to stop the car. The service members are of the external contracting type, while the emergency are internal expanding,

operated by the conventional hand lever. Both sets of bands are lined with a high grade material and operate on a large pressed steel drum securely mounted.

The springs of the Vulcan are well designed, have ample clearance, and are so proportioned as to provide easy riding qualities. The front members are semi-elliptic, and the rear, three-quarter elliptic. They are 46 inches long, 1.75 wide, and the steel utilized is a special alloy and very flexible. The spring eyes are bushed with Tobin bronze, the bolts being ground carefully to size, and provided with grease cups. The rear springs are secured to large pads by drop forged clips.



**A Few of the Special Tools and Jigs Utilized in the Machining of Parts Used in the Vulcan Car.**



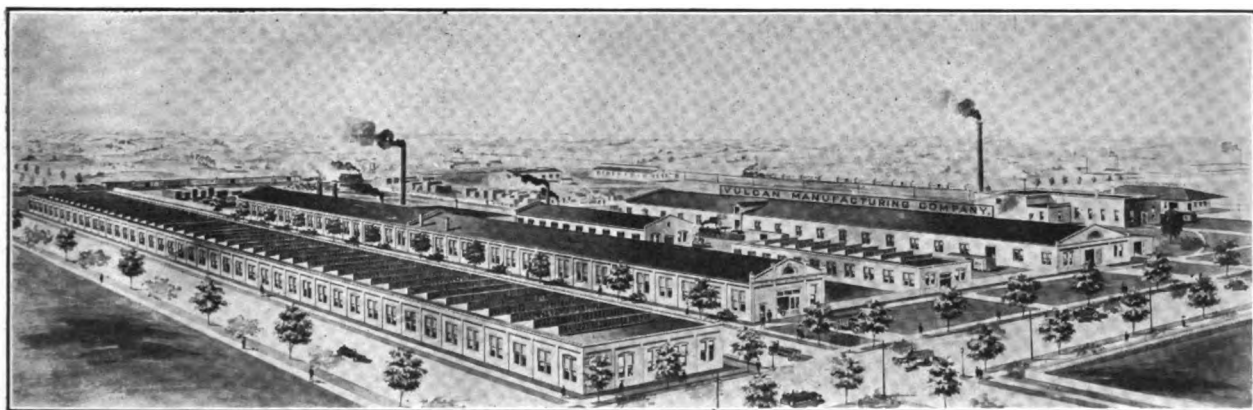
The frame is U section pressed steel of liberal dimensions, and the three cross members are rigidly braced. A kickup at the rear makes for a low centre of gravity. The wheelbase of the speedster is 105 inches, that of the five-passenger chassis, 115.

Left hand control is employed with the gear shifting and emergency brake levers at the right in the centre. The clutch pedal is at the left, with service brake and accelerator at the right. Clincher rims and 32 by 3.5-inch tires are standard equipment.

The body is not only attractive, but provides maximum room and comfort. It is constructed of live oak reinforced by drop forged body irons, securely bolted, and covered with heavy, bright finished body steel. Fore doors permit of entrance from either side. The seat is unusually wide and the back is high, supporting the shoulders. The relative position of the cushion, back

body is painted in a very attractive shade of dark olive green and the five coats are carefully applied and finished. The trimmings are triple nickel plated, and all black parts, such as screw heads, nuts, etc., are black nickered. The wheels are finished in dark olive green to match the body. The equipment of the Vulcan is very complete and the accessories are high grade, these including mohair top with adjustable curtains, slip cover, speedometer, latest design lamps, tools, tire repair kit, compound pump, jack and high grade windshield.

The company calls special attention to its selling policy, which aims to get its product to the purchaser with the least possible expense. In determining the list price no allowance has been made for the commissions of district sales agents, distributors, etc.—only that of the local dealer. The dealer's agreement is said to be particularly liberal and differs from the usual form in several



**Factories of the Vulcan Manufacturing Company, in Which Each Part and Unit Is Constructed in Large Quantities and to Accurate Proportions.**

and floor board, has been carefully figured out to provide comfort. The upholstery is luxurious and durable, long spiral springs being covered with a thick padding of curled hair.

The fenders and splash aprons are of heavy gauge, bright finish steel with lips and beads to obtain stiffness and permanency of shape. The bracketing combines light weight and rigidity. The headlight and fender brackets are combined by a triangular leverage. The steps on either side are supported by strong angle irons extending across the chassis beneath the running boards. These irons are suspended from the main frame by vertical forgings, a construction eliminating vibratory and twisting strains.

The hood, fenders, gas tank and running gear are finished with two coats of black enamel, baked on over a special metal primer, preventing rust and making for adhesive qualities. The

ways. The sales department of the company is headed by men of wide experience in the automobile industry and all selling expense is reduced to a minimum. The location of the plant is ideal for a quantity production and the shipping facilities are excellent.

The officers and directors of the Vulcan Manufacturing Company are men of wide business experience, each chosen for his special fitness to the work at hand. F. H. Murray, president of the company, is well known throughout Ohio, and R. G. Ewell, the vice president, is conceded an authority on business economics, and has a wide experience in advertising and sales promotion. E. D. Heartwell, treasurer, is well and favorably known in Ohio banking circles. The other directors, H. E. Hammar, J. C. Ward, William Truby, E. E. Lawrence and W. H. Becker, are business men of prominence.



## NEW AND NOVEL ACCESSORIES THAT APPEAL TO MOTORISTS

**Talking Horn.**

A signalling device which presents interesting features, in that it may be utilized as a signalling horn or to produce sounds closely resembling the human voice, is the Talking Horn, manufactured by the Talking Horn Company, Middletown, N. Y. It resembles in appearance the conventional types of signalling members, but is manually operated, a small handle being fitted. When this is moved to certain positions, then rotated to the left, it is stated that it will talk, producing one of three phrases, "Hello Mama," "O Mama" and "Mama." The maker of the device claims that the resulting effect is pleasing to the pedestrians and that sound can be heard for a considerable distance. By rotating the handle anti-clockwise a plain sound is produced. The positions for the different phrases are lettered on a dial under the handle and it is stated that with a little practise one can manipulate the handle without reference to the marks. The device comes finished in brass or nickel to match the car. The company also produces the O. B. horn, similarly operated, but without the talking feature, and one adapted to the motorcycle.

**Cutler-Hammer Switch.**

The Cutler-Hammer Manufacturing Company, Milwaukee, Wis., is producing a neat, compact single switch for lighting purposes, designed primarily for use with low voltage systems. It has a current carrying capacity of 10 amperes at 80 volts; operates with a quick make and break, and is a simple three-piece mechanism. The insulating material is both fire and water proof, and the mechanism cannot jar loose. The position of the push bar indicates whether the switch is open or closed, and a feature of the design is that it may be operated in concealed places, it being possible to tell by touch whether the switch is on or off. Pushing the button opens the circuit, thereby avoiding opportunity of accidentally closing the circuit in the day time and running down the battery when the lighted lamps would not be noticed. The face plates are supplied separately, have bevelled edges and are applied after the switch is installed and without cutting.

**Se-Ment-Oil.**

Se-ment-oil is manufactured by the Northwestern Chemical Company, Marietta, O., and is a colored powder like material which is soluble in water. When poured into a radiator it will dissolve easily and will remain in a fluid state until it comes in contact with a leak in the cooling system, when it will congeal, cementing the cavity. It takes but a short time for the cement to set, after which the radiator is flushed out with clean water. It is a chemical preparation and is held not to injure the cooler or impair its efficiency. Much of the deposits

caused by the use of hard water is removed by its use. It comes in a small package and is inexpensive.

**Noera Oil Gun.**

The Noera Manufacturing Company, Waterbury, Conn., is marketing an improved oil gun which is provided with a crooked handle, facilitating its operation. The gun is 1.25 inches in diameter, eight long, and is constructed of a high grade brass, nicely polished. It will handle equally well, light or heavy oils, and is provided with a double plunger, one set drawing in the lubricant and the other forcing it out to the part to be lubricated. The Noera oil gun is also made with a round handle.

**Old Sol Universal Lamp Bracket.**

The Old Sol universal adjustable lamp bracket is the product of the Hawthorne Manufacturing Company, Bridgeport, Conn., and is designed especially for motorcycles. The maker states it will fit any standard make of machine. The bracket with the rigid truss type of clamps permits of mounting a gas tank, generator or storage battery and all makes of lamps. When the tank bracket is installed the company supplies bands for holding the tank in position. A flat plate punched with a hole and equipped with a locking device and bolts is furnished with the generator type.

**Blue Head Spark Plug.**

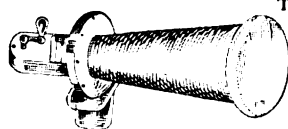
The Blue Head spark plug, manufactured by the Perpetual Spark Plug Company, 330 East Drinker street, Dunmore, Penn., is a popular priced plug and differs from ordinary design in that it is practically of one-piece construction. The central electrode is baked in the porcelain and the latter is placed in the shell by a similar process. This eliminates joints, gaskets, etc., making for a gas tight design. One of the features of the plug is the shape and location of the spark gap. The wire is bent upward to within a short distance of the shell, the maker stating that the construction prevents short circuiting by oil, also makes for easy cleaning.

**Greenfield BX Cable.**

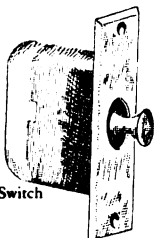
The Sprague Electric Works of the General Electric Company, New York City, manufactures the Greenfield flexible steel armored cable, also known as the BX cable. It is a weather proof construction, possessing great mechanical strength, maximum flexibility and ability to withstand chafing. It is constructed with single or twin conductors.

**Berling Magneto.**

A large spark, compactness of design and simplicity are emphasized with the Berling magneto, produced by the Ericson Manufacturing Company, 1119 Military road, Buffalo, N. Y. It is constructed for motor car and stationary engines, motorcycles, etc., and is held to be wa-



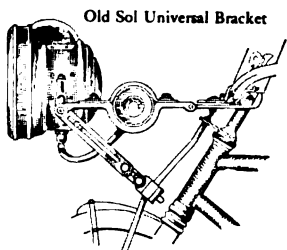
Talking Horn



Cutler-Hammer Switch



Noera Oil Gun



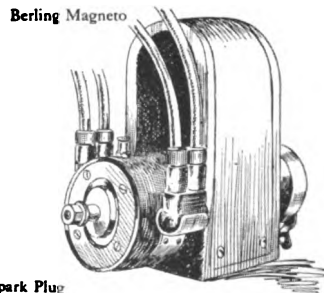
Old Sol Universal Bracket



Se-ment-oil

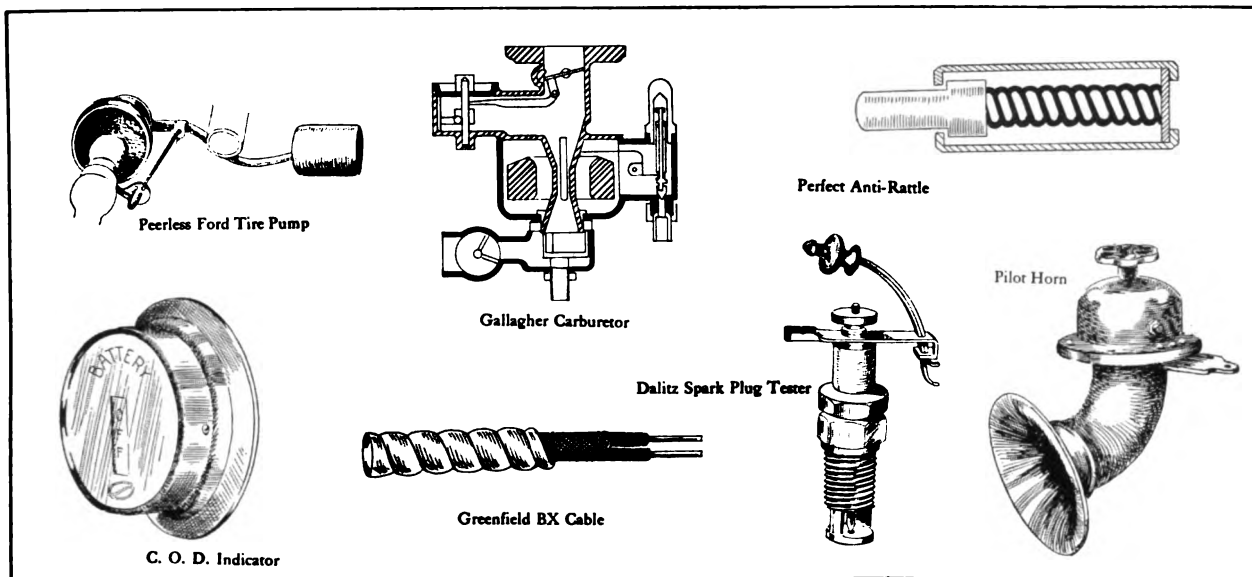


Blue Head Spark Plug



Berling Magneto





ter, oil and dust proof. It is of the true high-tension type, and it is claimed that it will start a motor with the spark retarded and that throughout the best of material and workmanship are incorporated. The frame is a solid unit and all parts are easily accessible. The high-tension cables are so mounted that opportunity for short circuits by water is eliminated. The type N is supplied in one, two and four-cylinder models.

#### Peerless Ford Power Tire Pump.

Power tire pumps on the motor car are a valuable addition to the equipment, saving as they do the work of pumping by hand. The Peerless Accessories Manufacturers, 1926 Wabash avenue, Chicago, is marketing a design for model T Ford cars which is driven from the extension of the crankshaft of the motor and is attached by drilling a single hole. A special fan pulley is furnished to replace the old member, and it is claimed that the power pump may be installed easily. The pump cylinder is cast iron and the piston rings are carefully fitted. All bearings are brass. The pump is operated by a rod extending to the front of the radiator. The company claims it is the first pump to be driven from the engine shaft. It is moderately priced.

#### Gallagher Carburetor.

Among the features claimed for the Gallagher carburetor, made by the Gallagher Carburetor Company, Inc., 1876 Broadway, New York City, are: That it is mechanically operated without springs, cams or balls, and that there are no automatic movements to be affected by fuel and atmospheric changes. The supply of air and fuel is regulated mechanically and all parts are adjustable to meet requirements of service. Two jets are utilized, one being a fixed member, the other a mechanical, the latter coming into service when the throttle is opened. The fuel supply to this jet is operated independently from the fixed member by a mechanical needle which comes in contact with the nozzle when the throttle is closed, but rises when the throttle is opened, admitting gasoline in proportion to the air. The fixed nozzle is supplied with fuel by a set needle valve and it has its own air intake. It is utilized for starting purposes and for low motor speeds. The needle valve controlling the flow of gasoline to the float chamber is adjustable by simply removing a screw cap. Provision is made for hot air or hot water heating, or both. It is stated that the carburetor is easily adjusted and provides maximum efficiency with a minimum consumption of fuel.

#### Pilot Horn.

The Pilot horn is the product of the Nonpareil Horn Manufacturing Company, 75 Wooster street, New York City. It is mechanically operated, dispensing with batteries, wires, etc., and there is no other expense involved than its first cost. It is operated by a small, conveniently located hand wheel, a slight turn of which produces a low

and pleasing tone. The sound may be increased to a loud blast by increasing the speed of rotation, and the maker states that this construction permits a wide range of sound as desired. It is furnished with brackets for attaching to either the right or left hand side of the car, and is also made with a straight projector and a fore door bracket. The finishes are: All black, black and brass, black and nickel. A design for the steering column is constructed, a special bracket being made.

#### Perfect Anti-Rattle.

The Adams Manufacturing Company, Kansas City, Mo., is marketing the Perfect Anti-Rattle, which is designed to be placed between the door and jamb of a motor car body and to eliminate existing rattles due to warping or faulty fitting of the door. The device comprises a barrel member in which is a spiral spring. The design also includes a bumper or plunger as shown in the accompanying illustration. The barrel is constructed of brass and fits tightly into the hole bored in the door jamb. When the door is closed the spring pushes the bumper against the door, holding it firmly and eliminating, it is said, all rattling.

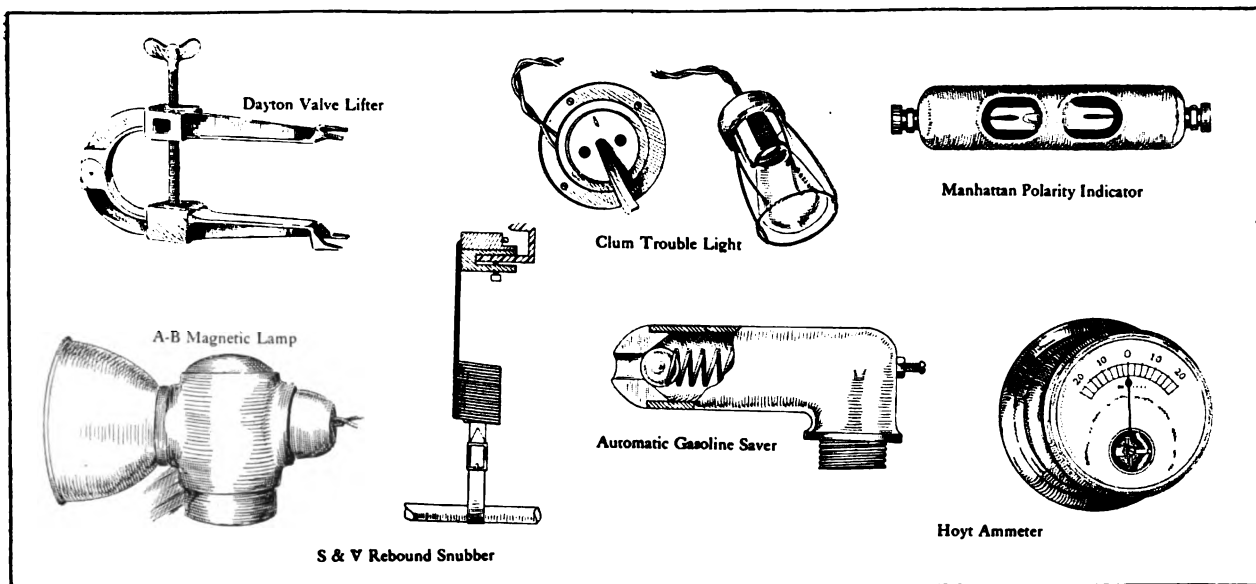
#### C. O. D. Indicator.

The Roller-Smith Company, 203 Broadway, New York City, maker of electrical equipment, has brought out a new current indicating device which is termed the C. O. D., from its three indications, "Charge," "Off" and "Discharge." It is designed for service with electric lighting and motor starting systems and to indicate whether the battery is being charged, discharged or the generator is inoperative. The device is located on the dashboard and has a rectangular dial opening through which in the condition shown appears the word "Off." When current flows from the generator through the indicator to the cells of the battery the word "Charge" immediately appears, no matter how slight the rate of current. When the battery is called upon to supply electricity to the lamps, for example, the word "Discharge" appears. It is claimed that no springs, cams, levers or mechanical multiplying means are employed, there being but one moving part. The circuit through the instrument is of heavy copper strap of a cross section greater than that utilized for the ordinary wiring circuit, so that losses are negligible, and there is no possibility of a burn out.

#### Dalitz Spark Plug Tester.

The usual method of locating a missing cylinder is to short circuit the second wire at the spark plug with magneto ignition or to hold down a vibrator with the coil and battery system. When using a screw driver for testing, one is likely to receive a shock unless care be exercised. The Dalitz Manufacturing & Sales Company, 803 Union street, Seattle, Wash., is marketing the Dalitz spark plug tester and terminal, which is a simple device for attachment to the plug. It comprises a flat strip of





metal, having at one end a terminal for the reception of the secondary wire, and an opening at the other in which is inserted a movable arm of metal. This arm is equipped with a non-conducting handle, preventing any possibility of shocks when using the device. To cut out the ignition to a cylinder the movable arm is slid downward until its end comes in contact with the base or shell of the plug. This effectually grounds or short-circuits the current, preventing it from reaching the air gap. The device may be utilized for a number of other purposes, including that of testing the strength of the secondary current. This is performed by moving the arm in proximity to the base of the plug and noting the intensity of the spark. The tester may also be employed to note the compression of each cylinder when in operation, by the strength of the explosion. Another use for the device is locking the ignition. This is obtained by grounding each arm when the car is left unattended.

#### Dayton Valve Lifter.

The Dayton Malleable Iron Company, Dayton, O., is marketing a new valve lifter which is a U shaped member with integral tapered points. It may be utilized in the conventional manner or to compress the spring by placing the points between the coils. It is operated by a wing headed screw bolt having sufficient leverage to compress the spring with a minimum of effort, and one of the features of the device is that both hands may be used in displacing the locking mechanism of the valve, the tool remaining in a locked position. The maker states that it will fit all types of motors. It is moderately priced.

#### Automatic Gasoline Saver.

A device which is stated will save 25 per cent. of the fuel and increase the efficiency of the motor is the Automatic gasoline saver, the product of the Automatic Gasoline Saver Company, 1777 Broadway, New York City. It is utilized with the carburetion system and comprises a hollow circular metal member having an air inlet at the bottom. A metal ball seats in this opening and normally closes the aperture by the pressure of a spiral spring. The movement of the ball from its seat is regulated by the spring and by the suction of the piston of the motor. Means are provided for suitably tensioning the spring to regulate the amount of air admitted. The principle involved is that of atomizing any particles of fuel not properly vaporized by the carburetor, thus permitting less fuel to be used.

#### Clum Trouble Light.

The Clum Manufacturing Company, Milwaukee, Wis., has brought out a trouble light attachment which is designed for service with its standard model lighting switch, providing a means for attaching an inspection light without any additional wiring. The lamp is oper-

ated by a simple socket and plug connection, as shown in the accompanying illustration.

#### Manhattan Polarity Indicator.

In charging storage batteries, and in wiring some circuits, it is essential that polarity be observed, and this is not always easily determined as the identification marks may be obliterated. The Manhattan Electrical Supply Company, 17 Park Place, New York City, is manufacturing the Manhattan polarity indicator which, when connected in the circuit, will instantly detect the negative and positive poles. It is very compact, being 3.5 by .75 inch, and a nickel plated shell encloses and protects the glass tube from injury when carried in the pocket or in the tool box. It is made for battery service, also for service with current ranging from 50 to 600 volts.

#### A-B Magnetic Trouble Lamp.

The Adams-Bagnall Electric Company, Cleveland, O., is marketing a handy trouble electric lamp that differs from the conventional designs in that it is of the magnetic type. It is equipped with a flexible lamp cord and terminals for attachment to the storage battery, and when the base of the lamp is placed in contact with iron or steel, it will stick. This is due to magnetism and it is claimed that the magnet has a pull of 13 pounds. The device makes for convenience in that it may be placed as desired, to project the rays onto the work and to permit the use of both hands when making adjustments or repairs. The magnet is covered with aluminum and the silver plated reflector is 2.5 inches in diameter. The light weighs but 13 ounces.

#### Hoyt Ammeter.

Owing to the demand for a miniature switchboard type of ammeters and voltmeters, for service with lighting and motor starting systems, motor boats, etc., the Hoyt Electrical Instrument Works, Penacook, N. H., has brought out what is known as the type 22, which is very compact, being but 2.25 inches in diameter. They are designed for service with direct current and operate on the D'Arsonval principle. Jewel bearings are incorporated and they combine all the qualities of the larger instruments for which this company is noted. The voltmeters and ammeters are constructed in four sizes, for 10, 15, 30 and 50-volt systems. The indicating hand registers both charge and discharge with the ammeter types.

#### S & V Ford Rebound Snubber.

Sunvold & Larson, Sacred Heart, Minn., is manufacturing a rebound snubber designed especially for model T Ford automobiles. It comprises a strap, coil spring and a device for attaching to the frame and it is stated that it may be fitted without the drilling of holes, etc. The function of the snubber is to eliminate road shocks and to prevent undue recoil, which results in breakage of the springs. The S & V design is applicable to both the front and rear of the Ford car and comes in pairs or a set of four. It is moderately priced.



## MECHANICAL NOTES FOR OWNERS.

### Explaining Different Wiring Plans of Electric Lighting and Motor Starting Systems--- How Clutch of Model T Ford Is Adjusted---Home Made Terminals.

IN ITS booklet dealing with electrical installations on automobiles and motor boats, the Packard Electric Company, Warren, O., calls attention to the importance to every owner of securing a wiring diagram of the installation of the electric lighting and motor starting system on his car. It is further suggested that he should understand it and be able to trace the path of the current flow over each circuit. He should be able to locate every place where wires are connected, whether to other wires, to switches, fuses, battery, generator, lamps, etc.

In studying a wiring diagram the first thing to determine is whether it is a one, two or three-wire plan. The first named is easily ascertained as the wires are utilized only to lead current to the place where it does its work—that is, the lamps—the return being made through the ground as is standard in ignition systems.

The two-wire plan is shown at Fig. 1, in which it will be seen that one wire, the positive +, leads directly from the battery to the switch, where distribution to the various circuits is made. In tracing the flow of the current it will be noted that it leaves the headlight section of the switch and passes to the connection A, where it divides, part going to one lamp and part to the other. On the return, current from both lamps passes over the same wire. The headlights are connected in multiple; that is, the current does

not have to pass through one lamp then through the other before reaching its return path.

The side light circuit is similar to that of the headlights, but it will be noted that the returning current is led to the same wire used for return from the headlights, as will be seen by reference to B 1 and B 2. The tail light circuit is simple, although here the common return wire is utilized, which is also connected to the return battery wire C. If a horn were to be added, one of its wires would be connected to the feed wire between the battery and the switch, and the other to the common returning wire to the battery.

The three-wire plan is employed when six-volt lamps are utilized for lighting and a battery of higher voltage for starting. A wide range of voltages is used by makers, 12, 16, 18, 24 and even 30-volt being utilized to meet the requirements of designs. While the wiring diagrams of such systems appear complicated to the average car owner, the fundamental idea can be understood readily by a little study of Fig. 2, which shows a 12-volt battery used in connection with six-volt lamps.

Although the battery is a 12-volt member, which is required for the 12-volt electric motor, it will be seen that it is in effect divided into two six-volt members by means of the third wire C, which runs from the centre cell connection to the switch. It will also be noted that there are

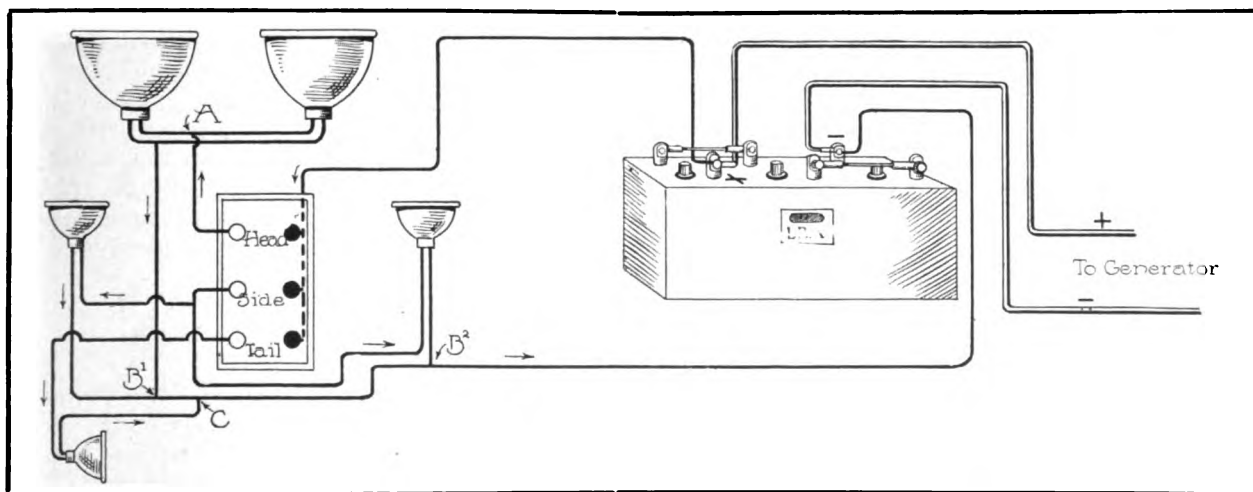


Fig. 1—Assembly Drawing Showing Electric Lighting System, Having Six-Volt Battery and Lamps and Employing the Two-Wire Method.



six cells. The voltage of a battery may be determined easily by observing the number of sections on the top cover, each representing two volts. If a one-piece cover be employed, and the terminal posts are brought above it, each pair of posts will represent two volts.

The headlight circuits are traced easily in the three-wire plan. The current leaves the positive terminal of the B section of the battery, flows to the right headlight and returns to the switch, thence by the way of the wire C to point X, which is the negative — terminal of the battery half B. Point X is also the positive + terminal of the battery half A and thus the current leaves X through the wire C to switch, to the left headlight and back to the — terminal of battery half A. It will be seen that the wire C takes care of currents in opposite directions and actually carries only the difference in the two current values.

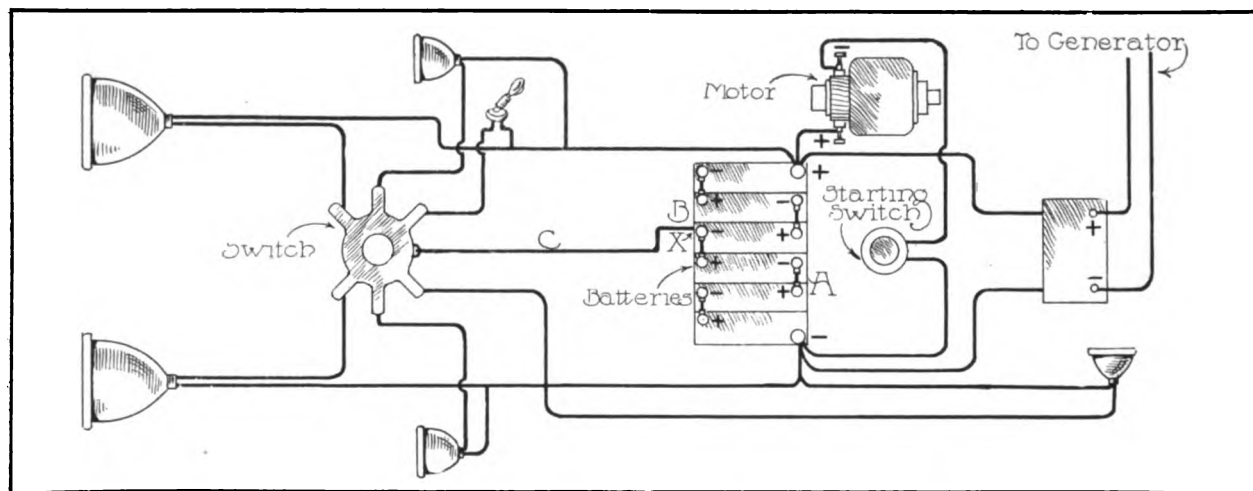


Fig. 2—Wiring Diagram of Three-Wire Lighting and Starting System Employing 12-Volt Battery Which Is Divided to Permit Use of Six-Volt Lamps—The Starter Is a 12-Volt Motor.

When these are equal, that is, when both lamps are drawing the same amount of current, no electricity whatever flows in C. If one lamp burns out, C carries the full lamp load.

The right hand side light and the speedometer lamp are served by battery half B, while the left hand side light and the tail lamp draw current from battery half A. Only one-half of the switch is shown, the other section being arranged to permit of turning on the headlights, side or tail lamp separately. The starting motor takes the maximum voltage of the battery, as shown by the connections.

### STOP FOR CAR.

A motorist who has owned several cars and who stored his machine in a small garage where

room was limited, evolved a practical plan for placing his automobile as well as preventing injury to it in the event the brakes failed to grip properly. Two pieces of 3x4 joist five feet long were secured together and nailed to the floor within a suitable distance of the wall. Being six inches high, the structure would stop the motion of the car even if the brakes failed. The joists also served to denote the proper position of the machine when entering the garage.

### TAPING GAS TUBING.

The rubber tubing utilized to convey acetylene from the source of supply to the lamps deteriorates in time, owing to the action of the air and light. If the tube is a short one, between the metal pipe and lamps, for example, it may be covered with tape. To prevent crushing the walls

of the tube, a rod is inserted and by winding the tape carefully a neat appearing job may be the result.

This same method may be utilized with success where the tube is secured to the outlet of the generator. The stretching of the rubber causes it to deteriorate quickly and sometimes it is difficult to remove it when a new piece is to be fitted.

### ADJUSTING FORD CLUTCH.

In the August number of the Ford Times, a publication devoted to the interests of the Ford Motor Company, Detroit, is an illustrated article dealing with the adjustment of the clutch. The clutch is normally held in contact or engaged by a clutch spring shown in the drawing at Fig. 3,



and is disengaged by pushing forward a pedal or by utilizing the emergency brake lever.

If the clutch shows signs of slipping, that is, the motor races when ascending a grade or when the load is applied suddenly, it should be remedied. With the motor inoperative and the emergency brake lever moved forward to its maximum position, the floorboards and transmission cover are removed. Directly in front of the clutch spring will be noted three clutch fingers. Each has a cotter pin extending through it, and a set screw. By removing these pins the screws may be rotated.

It is best to give each set screw a half turn, and in order, then replace the cotter pin and try the action of the clutch. If it still slips another half turn should be made. It is important that each set screw be given the same number of rotations to insure proper operation of the clutch. The ends of the cotter pins should be spread as shown in the drawing to prevent their working out and changing the adjustment of the set screws.

### A CARBIDE HINT.

A contributor to a British motoring print suggests a method of handling carbide utilized in generators. It comprises placing the material in a linen or muslin bag for filling the generator. It is stated that it facilitates cleaning the generator and makes for convenience in replenishing the supply as the required amount is always available.

### CARE OF THE COIL.

The writer has frequently noted drivers operating their cars with the cover off the coil box, this presumably being done to adjust the vibrators when the car is running. The machine should not be operated with the coil units exposed as more or less dust is apt to find its way into them and cause short circuits, for which the maker of the system is blamed.

### HOME MADE TERMINALS.

More or less scrap accumulates in the garage and much of the material can be put to a good use—old copper or brass tubing, for example. This may be utilized to make low or high-tension terminals when a broken member is to be replaced with a new one.

Take a piece of tubing about two inches long

and having an inside diameter similar to the thickness of the cable. Remove about an inch of the insulation and spread out the strands, making sure that they come nearly through the tube. Next pinch the end of the tube over the bared wire in a vise or with a hammer. The opening in the end can be drilled to fit over the spark plug terminal or cut with transverse or longitudinal slots, according to the type of plug utilized.

### LOCATE A GANG OF THIEVES.

#### Police in St. Louis Succeed in Making Several Arrests for Stealing Cars.

For a number of months the industry has been convinced of the existence of an organized band of automobile thieves, who steal machines, disguise them by changing or obliterating the factory number, etc., and sell them in the smaller

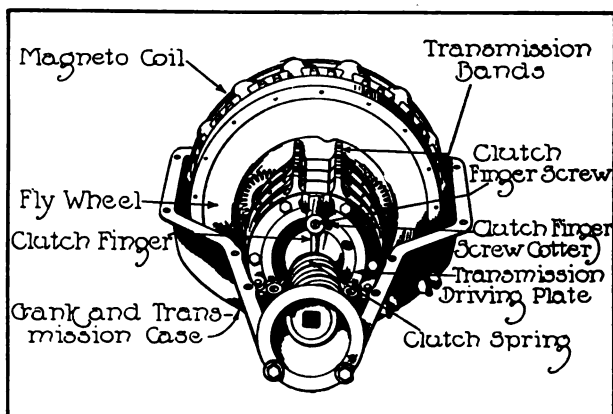


Fig. 3—Showing Components Utilized in Adjusting Clutch of Model T Ford.

towns of the country. There has been more or less difficulty in securing evidence sufficient to convict in many instances, but the police of St. Louis, Mo., appear to have succeeded in apprehending a number of those responsible for such thefts in the Middle West.

Soon after the Automobile Club of St. Louis offered a reward of \$150 for the arrest and conviction of those responsible for the theft of some 25 or 30 machines in that city during the last few months, eight arrests were made. Three convictions already have resulted from the crusade, which not only revealed the hiding place of those responsible for the thefts, but the existence of "fences" in the smaller towns of Missouri and Illinois, through which disposition of the stolen machines was made. Tools and equipment for making the desired changes in appearance and numbers also were located.





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## SPENDING AND SAVING.

There is an old proverb which reads, "Spend not where you may save; spare not where you must spend." It is very evident that the two sections are intended to be considered together, and the second portion is quite as important as the first. In fact, it almost may be said that he who spares not where he must spend, is not called upon to spend except where he may save.

Manufacturers of recognized standard articles have a reputation to maintain. Standard articles have become recognized as such because of the demand which has been created for them through extensive advertising campaigns. It follows that the goods which are best known are those which have been advertised best. In pur-

chasing these goods the consumer is protecting his own interests, since he cannot fail to appreciate that the maker has quite as much at stake.

The motorist who lays the emphasis upon the saving, in considering the first cost only, entirely overlooks the second clause in the proverb. The possibility of substituting goods of inferior quality for those of a recognized standard has its inception in increased profit for somebody, and the purchaser may be assured that he is not the one to profit thereby. It not only pays to advertise, but it pays to buy advertised goods.

## MOTOR TRUCKS AND ROADS.

That organized motorists should openly advocate the passage of legislation detrimental to the industry is difficult to believe, yet officials of the New York State Automobile Association are credited with stating that they will work for the enactment of a law limiting the weight of commercial motor vehicles. It cannot be contended that this position represents the opinion of the large body of motorists in New York State.

The movement had its inception in Massachusetts, where the state highway commission urged a law of this character early in 1912. In its latest report this commission renews its suggestion, but in a carefully prepared statement concerning highway conditions in that commonwealth, horse drawn vehicles are credited with having worked the greatest harm to improved roads. In at least one instance cited, when motor trucks were substituted for horses, the road was found to need patching only after three years of service.

The interest in good roads methods, which has become so widespread during the past few months, indicates that the general public is giving this subject the attention it deserves. The automobile is a practical conveyance. This is exemplified most directly in the mechanical transport. Its use means industrial progress. The time must soon come when highway authorities will direct their efforts toward meeting the issues squarely, instead of seeking to delay the inevitable.

Organized motorists would do well to study the proposition in all of its ramifications before taking action that may work decided harm to the industry they presume to represent. And those who have purchased motor trucks in good faith certainly have some rights that must be respected.



## OVERLAND TO BUILD BUT ONE CHASSIS.

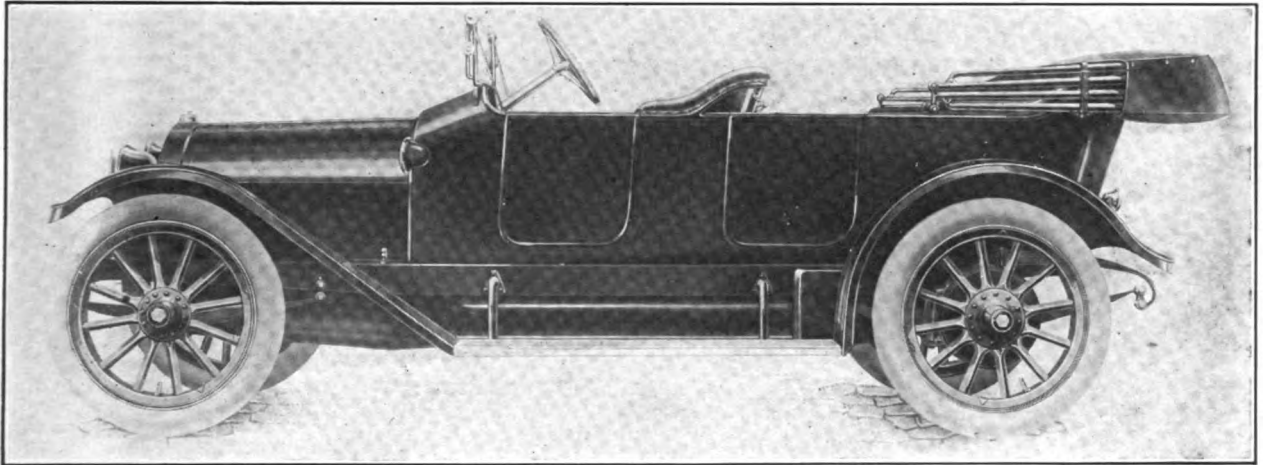
**F**OR the season of 1914, the Willys-Overland Company, Toledo, O., maker of the Overland, will offer but one chassis instead of two as formerly. The production plans include more cars than heretofore, and the standardization of parts and manufacturing in quantity has made it possible to reduce the price. The new chassis will be known as model 79, to which will be fitted three types of bodies, a five-passenger touring, a two-passenger roadster and a coupe.

The new chassis is similar to the 1913 model 69, but a number of changes are noted, these being practically in dimensions, as the Overland characteristics of mechanical design are retained. The motor is somewhat larger, the bore having been increased to 4.125 inches, although the stroke is

I beam type, is solid, and in assembling, the wristpin is passed through the opening in the piston wall, thence through the bearing bushing in the upper end of the rod. The connecting rod lower bearings are 1.75 inches in length. The camshaft is carried in three bearings.

The intake manifold has been redesigned, having a smaller diameter to compensate for the lower volatility of the gasoline, and yokes replace the flange method of retention. The inlet water manifold, however, is secured with flanges. Pressed steel is utilized for the lower crankcase, but the design remains the same. The three point suspension is continued.

The oiling system has been improved by the adoption of the constant level splash method, a



**Overland Model 79, Five-Passenger Touring Car, Having Attractive Body Lines, New Type Fenders, Deep Upholstery and Roomy Body.**

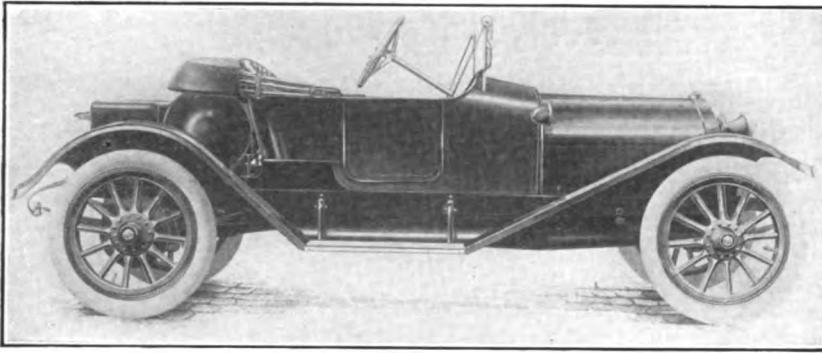
the same, 4.5. It develops approximately 35 horsepower. It is of the L head type, with individual cylinders and with the valves on the left. A change is noted in the valve mechanism, a new type of valve plungers being utilized, these having a yoke or dog, which bolts at its centre to the crankcase and retains two plungers for each cylinder. By displacing these drop forged yokes the pushrods may be removed without disturbing the camshaft. Quiet operation of the rods is assured by the use of bronze caps fitted over their tops.

The crankshaft is supported by five plain bearings, and the rear member is nearly twice the length of the others, being 3.125 inches. The lower connecting rod bearing caps are secured to the other half of the bearing by one bolt. The small end of the connecting rod, which is of the

gear driven pump supplying lubricant to the connecting rod troughs through four leads. From the troughs the oil flows into the bottom of the crankcase, where it is filtered, thence to a sight feed on the dash and to the troughs again. The excess of lubricant from the cylinder walls and interior of the motor, drains to a strainer, through which it passes before reaching the reservoir. A model R Schebler carburetor is fitted.

Thermo-syphon cooling is utilized, the same type of radiator being employed as was used on the model 71, but the inlet and exhaust water manifolds are larger. The fan belt is V shaped, instead of flat, and adjustment of its tension is by an eccentric mounting of the shaft carrying the fan and pulley. The eccentric bracket is attached to the crankcase. Ignition is by a dual system, a Splitdorf magneto, dry cells and a coil. The





**Overland Two-Passenger Roadster, Having Cowl Dash, 114-Inch Wheelbase and Baggage Carrying Compartment at Rear.**

frame rail instead of to the cross member as formerly. Both are cut from drop forged blanks and the gear is adjustable to four positions. The steering column is larger and the wheel has been increased to 18 inches in diameter. A lever for controlling the air of the carburetor is mounted on the column below the wheel. The usual cut-out is discontinued. It is fitted to order, however.

leather faced cone clutch with adjustable stop is continued.

Drive is by shaft, which is enclosed in a torsion tube yoked at its forward end, its two arms being hinged to the frame cross member to compensate for varying axle position with respect to the frame, as the tube is bolted to the gearbox at its rear end, and the last named component is rigidly bolted to the axle housing. Radius rods are also employed. Drive is through the torsion tube and springs. The universal joint is considerably larger than that used on model 71, and the ring and slip joint is made entirely from drop forged parts. It may be removed without disturbing other components.

The transmission is located at the rear and bolts through flanges to the axle housing and to the torsion tube. It is of the selective type, providing the three conventional forward speeds and a reverse. The main and countershaft assembly is constructed as short as possible, eliminating opportunity of springing. Imported annular ball bearings are employed throughout.

The rear axle is of the three-quarter floating type and Hyatt high duty roller bearings are utilized. The inner end of the axle shaft floats and the outer bearing is mounted outside of the axle housing, so that the shaft is subjected to no other stresses than of driving. A special thrust bearing takes care of side thrust, and is located at the inner end. The brakes are conventional, of the expanding and contracting type, acting on the wheel drums. The drum diameter is 13 inches, an ample braking surface. Equalizers are fitted.

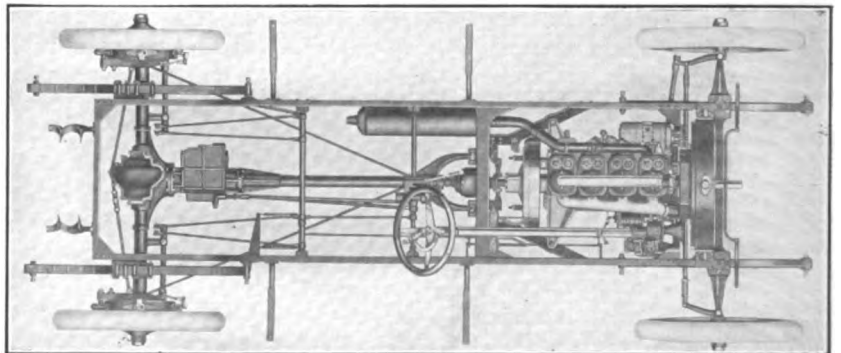
Steering is by means of an adjustable worm and gear, with the housing anchored to the side

beam section type, a drop forging with integral yokes and spring seats. The steering arm knuckles, tierod ends, etc., are also drop forged. Timken roller bearings are fitted to the front wheels. The sliding accelerator is replaced by the push type.

The frame is of pressed steel and is made heavier, due to the lengthening of the wheelbase four inches. It has been increased from .15625 inches to .1875. Semi-elliptic springs are utilized in front, three-quarter at the rear, all spring ends having bronze bushings and compression grease cups. Although the wheelbase has been increased, the hood has been lengthened but .75-inch and improved fasteners are noted. Right hand drive with centre control is retained.

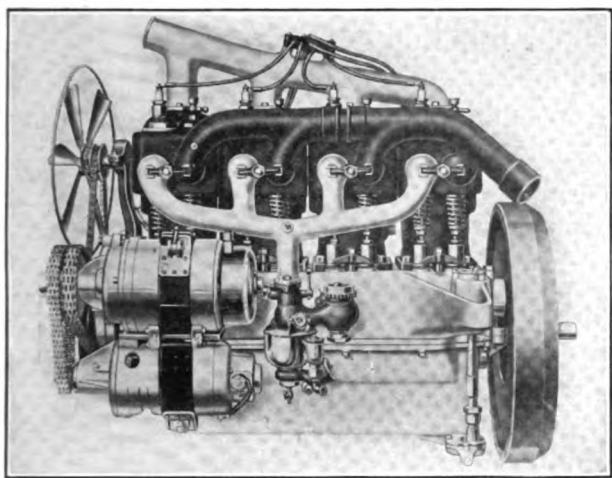
The fenders are crowned and rivetless, a new design and one adding to the attractive appearance of the car. The rear fenders follow the line of the wheels, while the front members slope away with a reverse curve to meet the long running boards, which are noticeable for their clean appearance.

With the exception of .75 inch, the increase in wheelbase has been given the body, the sides of which are slightly higher. The doors have been changed, they now being of full U shape. The



**Chassis of the New Overland, Having Same Characteristics of Mechanical Design as the 1913 Models.**





**Power Plant of New Overland, Showing Method of Retaining Manifolds, New Retention of Valve Plungers and Location of Gray & Davis Lighting and Starting Units Driven by Silent Chains.**

thickness of the upholstery has also been increased. All hinges are concealed. The five-passenger touring body is finished in dark green with light green striping, and nickel and aluminum trimmings. At the rear of the front seats is fitted a protector strip to prevent injury to the finish by the passengers' feet.

The roadster body is an attractive design, also having a cowl dash and with a 32-gallon fuel tank at the rear. Instead of the sloping deck is a large steel tool compartment. The windshield braces extend rearward instead of toward the front. The tops are hooked to the side light brackets, leaving the front of the car unencumbered and adding to its appearance when the top is in position. The touring car and roadster are equipped with an electric horn, Stewart speedometer, clear vision ventilating windshield, mohair top, side curtains and boot, tools, jack and pump. Current for the electric lights is supplied by a storage battery of ample capacity, and an ammeter is standard equipment. Both models have rear vertical tire carriers.

The Overland coupe comes equipped with the Gray & Davis electric lighting and motor starting system. It accommodates four passengers, all facing forward, the driver's seat being slightly in advance of the others. The upholstery is Bedford cloth and the upper portions of the body are in natural wood finish.

A covered compartment at the rear of the driver provides room for storage of articles. The body is made attractive by the use of plate glass sides, round and sashless, at the right and left of the windshield.

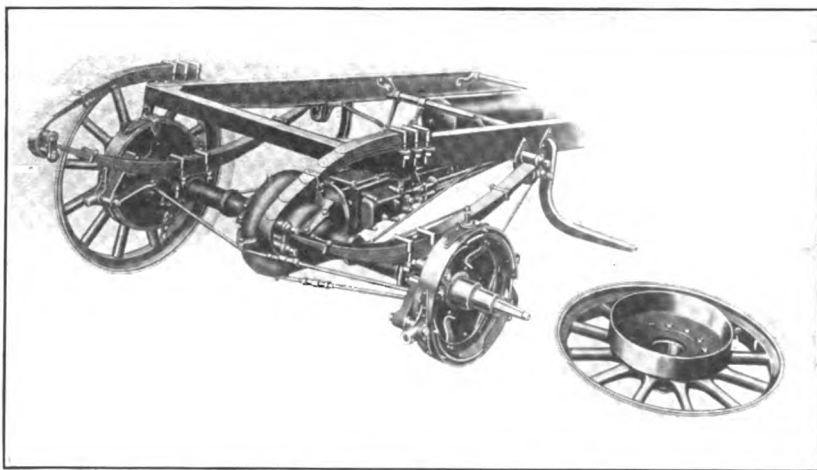
The Gray & Davis system is supplied at a slightly increased cost on the touring and roadster models. This comprises two units, a generator and a motor, which are mounted on brackets integral with the crankcase, and are driven through silent chains. The Gray & Davis system has been described fully in these columns.

### BOSTON SHOW DATES.

**Dealers Will Make Display of Both Pleasure and Commercial Car Lines.**

Although the Automobile Chamber of Commerce, as the national association of automobile manufacturers is now known, has decided to abandon the exhibition of motor trucks and business wagons, the people of New England and the East will have opportunity to study the merits of the various productions in this line at the 12th annual Boston automobile show.

As has been true during the past few years, this exhibition will follow that of pleasure cars in Mechanics building. The pleasure vehicle section will be held under the auspices of the Boston Automobile Dealers' Association, March 7-14, while the trucks and business wagons will be shown under the auspices of the Boston Commercial Motor Vehicle Association, March 17-21. Both shows will be under the personal management and direction of Chester I. Campbell.



**The Three-Quarter Floating Type of Axle Is Continued and the Frame Has Been Increased in Size.**



## WITH THE MOTORING INTERESTS ABROAD.

### Boillot and Peugeot Create New Record in Winning Fifth Annual Mont Ventoux Hill Climb--Mea Magneto Victorious in Ireland--Foreign Notes.

**S**TILL further establishing its reputation as a winning combination, Georges Boillot and a Peugeot car took the annual Mont Ventoux hill climb in France, Aug. 24, creating a new record for the course. The "hill" comprises about 13 miles of steep and tortuous grades. Boillot covered the distance in 17:38, reducing his own mark of 17:46, set last year. Incidentally, it may be remarked that this is the fifth time in as many years that the Mont Ventoux event has been taken by the same machine as that which finished a winner in the French Grand Prix, although it must be remembered that these five times were not in succession, since there was no Grand Prix some years.

The other class winners and their times were:



Lacre Police Patrol in Service in Glasgow, Scotland.

Marsaglia, Aquila Italiana, 21:52; Argentina, Aquila Italiana, 22:58; Gaste, Vermorel, 26:28; Riviere, Metallurgique, 26:42; Juvanon, Schneider, 28:17; Gehin, Peugeot cyclecar, 31:30.

#### LACRE POLICE PATROL.

#### Some Particulars in Which British Product Differs from American.

The accompanying illustration will serve in a measure to indicate some of the points in which the motor driven police patrols made in England differ from those produced in this country. The machine is the product of the Lacre Motor Car

Company, Ltd., Letchworth, England, and is one of the first to be supplied to the Glasgow Corporation, which conducts the municipal affairs of Glasgow, Scotland. The chassis is that of the regular 30 horsepower Lacre, on which the company installs its two-ton truck bodies, and it also is used for ambulances, mail wagons, etc.

It will be noted that the exterior of the body is without windows. Prisoners are placed in cells along either side of a corridor extending from the back of the driver's seat to the door at the rear. Ventilation is provided by barred openings near the top of the cells in the roof over the corridor and in the rear door. Two steps lead from the ground to a landing at the rear and on either side of this platform is a seat for an attendant. Other policemen may be accommodated beside the driver or along the running boards at the side. This type of vehicle not only serves as a patrol wagon in making arrests, but is used as a prison van, the cells being arranged so that it is possible to transfer dangerous criminals or even insane persons without danger to themselves or others.

#### WHAT IS A CHAUFFEUR?

#### British Motorists Undetermined as to Whether He Is a Servant or a Mechanic.

It hardly will be contended that American motorists will be concerned over the legal status of a chauffeur, but the subject appears to be of serious moment, just at present, in Great Britain. In June the county bench at Canterbury, England, was called upon to decide whether a chauffeur is a domestic or menial servant entitled to a month's notice on dismissal, or a mechanic who can be dismissed on a week's notice. The bench decided in favor of the latter definition, and the following comment of a legal adviser in a recent issue of the Autocar, a British motoring print, will prove of passing interest, at least:

It would, of course, be impossible to show that a motor 'bus driver was a domestic or menial servant, but a coachman is if he "lives in," and it seems to me that a chauffeur is on the same footing. In Mahaffy's "Law of Motor Cars" the matter is referred to as follows: "It is now a settled custom that in the case of domestic or menial servants one month's notice is sufficient. It is a little difficult to say whether a chauffeur is a domestic (menial) servant or not, since it has yet to be decided,



but it is here submitted that, inasmuch as a huntsman and a head gardener living upon the estate have been held to be menial servants, and therefore only entitled to one month's notice, a chauffeur must also be included in this division."

After quoting a case showing that to be a domestic or menial servant, the service must be of such a domestic nature as to require the servant to be frequently about his master's person or about his grounds, the writer before mentioned adds: "By the same reasoning a chauffeur is engaged about his master's garage, and driving his master or his family from place to place. It is thus hard to see how a chauffeur can be anything but a menial servant."

In another case, menial servants are defined as those persons whose main duty is "to do actual, bodily work as servants for the personal comfort, convenience, or luxury of the master, his family and his guests, and who for this purpose become part of the master's residential or quasi-residential establishment."

### MOTORING IN IRELAND.

#### Mea Magneto Shows Up Well in Recent Cross Country Endurance Trials.

Within the past few months there has been decided interest in motoring and automobiles in Ireland. The roads in the northern part of the island are particularly good, the British government having done much to place them in better condition during the past year.

That the Irish people are giving unusual thought to the subject is evidenced by the fact that one of the exhibits at the recent exposition of the Industrial Development Association in Belfast was a Belfast made 12-16 horsepower touring car, seating five persons and quoted at \$1680 without hood, windshield, tires or lamps. The motor was a four-cylinder unit, with 3.375-inch bore and five-inch stroke, and the car is said to have demonstrated its ability under severe tests.

Another evidence of the growing popularity of the motor car is found in the recent cross country endurance trials held in the hills of Craiganlet, in which the two first prizes went to a Gregoire and a Nom. Both of these machines were fitted with Mea magnetos, a source of some little satisfaction to the Marburg Bros., New York City, American distributor for this make.

### KEROSENE ON WORLD TOUR.

#### Wisconsin Students Now in Great Britain with Their Henderson Car.

Edwin Kohl and Klaus Bergenthal, University of Wisconsin students, who some time ago announced their intention of touring the world by automobile, starting for New York City from Indianapolis, Ind., on July 1, simultaneously with the Pacific Coast tour of the Indiana manufactur-

ers, have arrived in England. They will tour through that country, Scotland, France, Germany, Switzerland, Italy, Russia, China, Japan, and sail from the latter country for San Francisco. They expect to arrive in Indianapolis in about a year, after having covered approximately 27,000 miles, about 6000 of which will be water travel.

They are driving a Henderson car, made by the Henderson Motor Car Company, Indianapolis, and an interesting feature of the trip to motorists, in view of the high cost of gasoline, is the fact that kerosene will be used as fuel, owing to the equipment of Henderson machines with kerosene-burning carburetors.

### NEWS NOTES FROM FOREIGN LANDS.

R. N. Kelsey started recently from Cape Town, South Africa, for a drive across country to Cairo, Egypt, in an Argyll car with single-sleeve engine, made by Argylls, Ltd., Alexandria, Scotland.

It is reported that in the recent Grand Prix race at Le Mans Bosch magnetos and spark plugs were used in the first seven cars to finish. A Bosch magneto and Bosch plugs also were fitted to the Gregoire car, which won the Coupe de la Sarthe.

The Nachrichten fur Handel of Berlin, states that the employment of motor cars in the north of Spain is becoming more popular. A great many pleasure cars are being sold, chiefly of French manufacture. There are excellent openings in Galicia and Asturia, provided the business is entrusted to capable agents. The gasoline sold in the Spanish market is not very pure. The roads are good and a good trade in motor vehicles might be built up if proper attention were paid to local conditions.

There are 1269 automobiles and motorcycles registered in Nova Scotia. In September, 1912, there were only 971 registered. The Nova Scotian government's programme with regard to roads is not confined to one county, but includes every municipality in the province, and will probably be carried out annually over an extended period. Nova Scotia will have in four or five years roads that will be as good, if not better, than any in Canada.

The Coupe de L'Auto will be run over the Boulogne circuit Sept. 21 and to date the entries have been encouraging, as some of the best drivers in the world are included. There will be three Peugeot machines in the race, two of them being driven by Boillot and Goux; two Delage cars, driven by Bablot and Guyot; four Koechlin's, one being driven by A. G. Koechlin; two Buicks, one driven by Repousseau; three Th. Schnelder; two Zenias, one driven by Briand; two Sunbeams, driven by Chasagne and Resta; two Aldas, one driven by Tabuteau; two Vauxhalls, one driven by Hancock, and one Anasagastt, driven by d'Avaray.

Of the 45,000 people in Aden, Arabia, probably 300 are Europeans, comprising in most part, English army officers, city officials and merchants. Probably 75 per cent. of the Europeans have sufficient income to permit the purchase of inexpensive motor cars. There are 16 motor cars in Aden, of which number six motor 'buses are practically useless. There is one 3.5-ton French motor truck. Only two of these cars are American, but one owner proposes to introduce six Ford machines as public vehicles and has already ordered two. The people there did not formerly take to the low-priced American cars, but of late have conceded their merits. All machines in Aden have been introduced since 1910. Only two or three are sold annually. Their use is largely restricted to about 20 miles of road and this and the climatic conditions make it impossible to push the sale of automobiles with any degree of success.



## CORRESPONDENCE WITH THE READER.

**Flywheel Motor Starters.**

(1639)—I note in an advertisement of a certain car I am interested in, that the motor starter and generator is contained with the flywheel; that it is the U. S. L. system. Is it the same type as that fitted to the Ford, and how does the system operate? Do you consider it as good as some other systems where the generator and motor starter are separate units? Is the U. S. L. adaptable to any car? What is the difference between one and three-wire systems? C. A. S.

Savannah, Ga., Aug. 26.

The system referred to is manufactured by the United States Light & Heating Company, New York City, and in addition to starting the motor and lighting, may be utilized for ignition as well. It differs from the Ford in that it generates a direct current and therefore can be utilized for charging the cells of a storage battery. The output of the U. S. L. is so regulated that the proper charging rate is maintained; that is, a regulator is

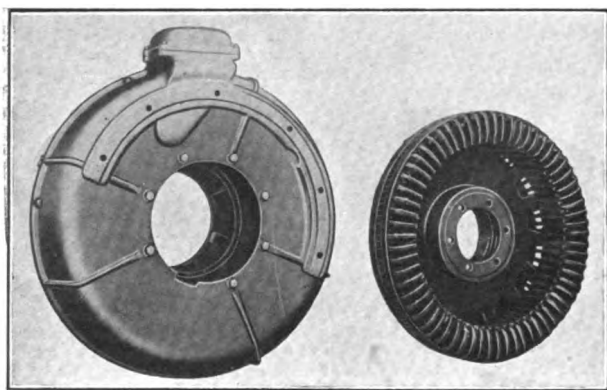


Fig. 1—Illustrating the U. S. L. Flywheel Generator and Field Secured to Crankcase of Motor.

utilized for control. The current generated by the Ford device is alternating and cannot be employed for charging a battery, although it is used for lighting purposes.

The U. S. L. has but one moving part, the armature, this replacing and performing the function of the flywheel of the engine. The armature, which is shown at Fig. 1, is bolted directly to the engine shaft flange, while the field or stationary part is secured to the crankcase concentric with the engine shaft. The advantages pointed out in the construction are: Noiseless operation, economy in weight, and the elimination of gears, sprockets, etc., since drive is by shaft.

The regulator mentioned controls the output of the generator, which keeps the battery in a fully charged condition. The cells supply current for starting, and by pressing a button the flywheel device becomes a motor, imparting energy to the crankshaft of the engine. Upon release of

the button or switch member, the motor becomes a generator.

Relative to the second question, it may be said that the U. S. L. is a very efficient system and that the workmanship and material are first class in every respect. Owners of cars fitted with this system have spoken very highly of it to the writer. The system is a manufacturer's proposition.

The difference between one and three-wire systems is explained elsewhere in this issue.

**Sal Soda Solution in Radiator.**

(1640)—I have been experiencing trouble with the radiator of my car getting very warm. The water does not boil, but it gets intensely hot. Have inspected the water pump and oiling system and both work perfectly. Carburetor has not been giving any trouble and the mixture seems to be very good. A friend of mine advised the use of sal soda to clean the radiator. Kindly advise if its use will in any way injure the radiator. C. G. B.

Pittsburg, Penn., Aug. 25.

A sal soda solution properly used will not injure the radiator. The heating is probably due to deposits in the cooler created by the use of hard water containing mineral deposits. In preparing the solution dissolve as much as possible in the water, employing the same amount as contained in the circulating system. After operating the motor, run off the soda and thoroughly flush the cooler with fresh water. It is best to change the water several times to make sure all deposits are carried out.

**Marking Timing Gears.**

(1641)—I am overhauling my motor and find it necessary to remove the magneto for repairs, also the camshaft. The gears are not marked in any manner and I haven't the timing plan, nor do I understand timing motors. What is the best plan to pursue to insure getting the shaft and gear back right? NEW SUBSCRIBER.

Logansport, Ind., Sept. 2.

The gears may be marked easily by removing the housing and by using a prick punch. At Fig. 2 is shown a front view of a motor with the gearcase displaced, and the manner of making the marks is also indicated. It will be noted that two are made on one gear, and that the third is made on the tooth of the adjoining gear, which meshes between the teeth of the first named gear. The same plan may be utilized if other gears are to be displaced.

**Nickel Steel.**

(1642)—In reading the car stories in your book I notice that some makes use a 3.5 per cent. nickel steel. What is nickel steel and what are its advantages over ordinary steel? CURIOUS.

Manchester, N. H., Aug. 30.



The material is employed in motor car construction in the percentage referred to because it possesses valuable properties, these being: Resistance to cracking, high elastic limit and homogeneity. In such places as axles and shafts are subject to fatigue the higher elastic limit of nickel steel makes for durability and long life, as well as offers great resistance to sudden strains of shock.

#### Camphor in Fuel.

(1643)—Is there any advantage in using camphor in the gasoline? A friend of mine, who claims to have considerable knowledge of automobiles, states that much more power is derived by its use. SKEPTICAL.  
Boston, Sept. 3.

According to tests conducted by an English engineer, there is no advantage in the use of camphor in the fuel, and some who have tried it state that they believed that a loss in motor efficiency was discernible. The tests referred to were conducted with two machines, a 10 horsepower Star and a 25 horsepower Vauxhall, having a wide difference in power and weight. The trials took place on a long, fairly steep incline.

A mark was made at the bottom of the grade and another at the top. The incline was sufficiently steep to cause both motors to labor when picking up on the high gear. The bottom mark in all tests was passed at a fixed speed noted on the speedometer and the rate was also observed at the finish. The tests resulted as follows:

First test, using gasoline only in the Vauxhall, the bottom mark was passed at 10 miles an hour and the car accelerated until the top was passed at 30 miles an hour. The test was repeated to make sure that the result was the same. The second test was with the same machine, but the fuel contained one-quarter ounce of the best known camphor to each gallon of fuel. There was no difference whatsoever in the car's accelerating powers on the hill, and there was no difference in the motor's running slowly or in its tendency to knock when the spark was advanced. The third test was with the Vauxhall with the gasoline camphorized to the extent of half an ounce in a gallon of gasoline, and the results were exactly the same. The same tests were made with the smaller car with similar results as to efficiency.

Economy tests were also held and it was found that the car ran further with gasoline than with the camphorized fuel. Speed tests resulted in similarity. The engineer in concluding his remarks states, "Motorists wishing to use camphor in the fuel should bear in mind that the cost a gallon is increased and efficiency is not increased." It would appear from the above that camphor does not add to the power of the motor.

#### Piston Clamp and Valve Seating.

(1644)—I read an account of how to make a piston clamp in one of your books, but it is not quite clear how it can be made as I am not much of a mechanic. If you could supply a sketch showing the clamp and how it is used it would be a great help. I notice that you frequently have drawings in answer to questions asked by your readers. The valves on my motor are in bad condition and grinding does not seem to help much. What is the best thing to do, buy new ones?  
W. A. C.

Hillsgrove, R. I., Sept. 3.

The piston clamp referred to is shown at Fig. 3 B and it will be noted that the ends are turned over as suggested in the article describing its manufacture. The method of using the clamp is shown at A, it being gripped by a pair of pliers after it is slid over the ring. Compressing the clamp likewise compresses the piston ring and permits the cylinder to be slid over easily. It is best to have one person operate the pliers and clamp device while another slips the cylinder on the piston. The sketch shows the clamp being

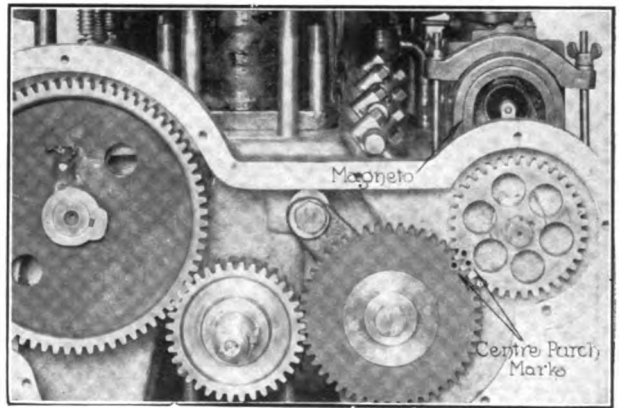


Fig. 2—Showing How Timing Gears Are Marked to Insure Correct Replacement in the Overhaul.

used on the bottom ring, this being merely to illustrate its use. In service the top ring is first compressed and the cylinder slid over, the remaining rings being fitted in sequence.

The valves are probably worn to a condition similar to the member shown at C. The remedy is to reface them and unless you are familiar with the work it is best to have it performed by an expert, although a valve seater could be procured and employed. At D is shown a method of refacing valves by utilizing emery cloth. A hole is cut in the material and the valve slipped through and rotated. Under the circumstances it would be best to consult an experienced repairman and the cost of placing the valves in first class condition should not be prohibitive.

#### Mora Motor.

(1645)—I am having oiling trouble with the motor of my car. It is a Mora and as the company has gone out of business I am unable to obtain any information as to



the system. Some one told me that the engine was made by the Continental people. Any information would be appreciated.

C. P. T.

Charlestown, R. I., Aug. 28.

The Continental Motor Manufacturing Company, Detroit, advises the writer that it has no record of ever making a motor for the Mora company. Perhaps some of The Automobile Journal readers who own Mora cars will supply data as to the cause of the lubrication trouble.

#### Storage Battery Trouble.

(1646)—Can you inform me what is the trouble with my storage battery? It is a six-volt, 40 ampere-hour. After having it charged it shows 6.25 volts, but after using it a few days in the car for ignition it falls off to about four volts. The charging man says the battery has outlived its usefulness and that it would be cheaper to buy a new one than to have it overhauled. The battery has given good service for over three years.

J. D. W.

New Haven, Conn., Sept. 5.

## CARE OF BALL BEARINGS.

### New Departure Manufacturing Company Issues Book of Valuable Suggestions.

Bearings in a motor car are most important components and the aim of the designer is to eliminate all friction and thereby avoid loss of power, a decided factor in the operation of a car. The repairman is often called upon to replace, adjust and clean ball bearings and the work requires a thorough knowledge of the construction and operation of the bearing if satisfactory results are to be obtained.

The New Departure Manufacturing Company, Bristol, Conn., maker of New Departure ball bearings, has compiled a manual which should be in the possession of every mechanic, repairman,

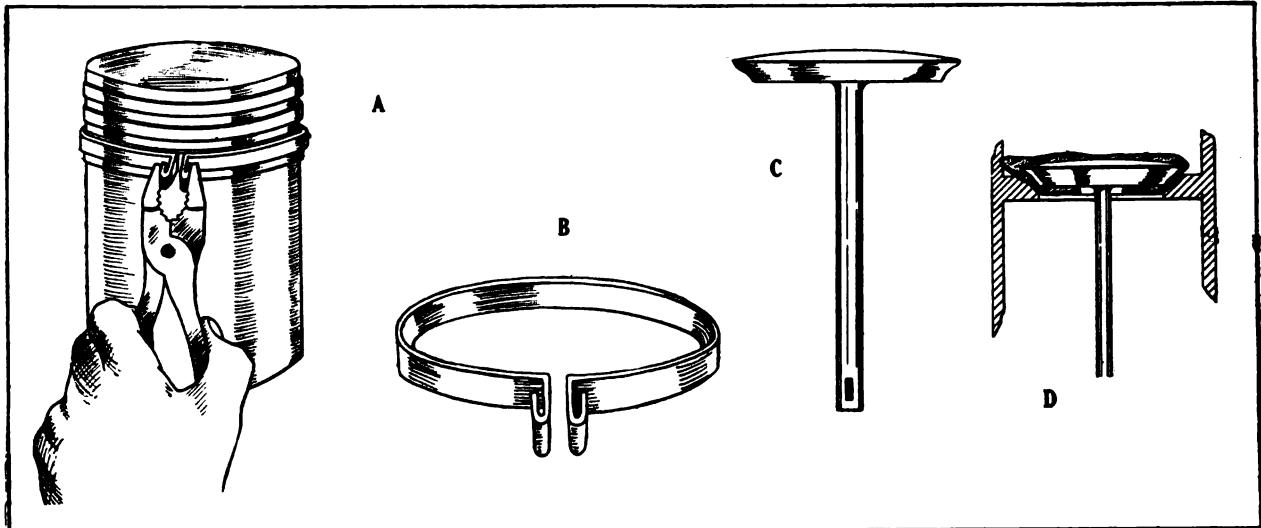


Fig. 3—Showing the Construction of a Piston Clamp (B) and Method of Operation (A)—C and D, Valve Requiring Refacing and Use of Emery Cloth for Resurfacing.

The fact that the charge does not hold indicates that there is trouble with the plates and these may be badly sulphated, buckled, or the cells full of sediment. The cost of overhauling it would hardly pay and it would be better to purchase a new one as the battery man recommends. If the maker maintains a service station within a reasonable distance, the battery might be sent for inspection and an approximate estimate secured as to the cost of putting it into serviceable condition.

John McCann, driving a 22 horsepower Metz car, made by the Metz company, Waltham, Mass., was a class winner in the recent hill climb at Richfield Springs, N. Y. This is the same make of car which won the Glidden trophy.

owner or operator of an automobile. It contains valuable suggestions for the best methods of removing and installing ball bearings, their lubrication and enclosure. The importance of proper maintenance, including cleaning, is defined, and a large number of illustrations make clear the points emphasized, and the book should prove of decided value as a work of reference.

The book is written in a clear, concise manner, free from technical expressions, all explanations being couched in such simple language as to be easily understood. The brochure also contains description and dimension data on all types of bearings made by the company. The book will be sent free of charge by applying to Department D of the New Departure Manufacturing Company, Bristol, Conn.



## IMPROVED ROADS AND MOTORING LAWS.

### Massachusetts Highway Commission Finds Horses Work the Greatest Damage-- What National Associations Are Doing--Brief Legislative Items.

**I**N VIEW of the position taken by the Massachusetts highway commission with reference to limiting the weight of motor trucks using the highways in that commonwealth, it is of interest to note some of the findings of this board in its annual report, just published. The volume covers 330 pages, and at the risk of omitting some of the points which tend to bear out its assertion that truck weights should be limited and that commercial vehicles should pay a larger license fee, the following is quoted:

The traffic study shows that it is not the number of teams, but heavy teams—two or more horses, and heavy loads on narrow tires—that cause the failure. The failure of roads treated with heavy oil has occurred on a few miles of road at certain places where it was clear that heavy horse drawn teams were responsible.

In two instances it was 50 to 75 ice teams a day, together with the other teams, carrying three tons or more each on 2.5 to three-inch tires. In a month the oil surface began to crumble and break up on the side of the road on which the loaded teams travelled. It lasted three months on the other side of the road, where these teams came back empty. This same road, treated with the same oil, is still in good condition beyond these ice houses; in one case for three miles, in the other for 15 or 16 miles, and the oil is three years old and still only needs patching.

One more instance of interest: The Gloucester state highway covered with a hot oil blanket was rutting and wearing out rapidly in 1909. A coal team was passing to some hotels three or four times a day during the summer, carrying six or seven tons of coal on narrow tires. A motor truck was substituted for the coal team, and the surface of the road, which had been oiled, was again in good condition. It has worn three years and now only needs patching.

### LINCOLN HIGHWAY ASSOCIATION.

#### Aims and Purposes Set Forth in Statement to Governors' Conference.

In order to prevent misunderstanding and to show what the Lincoln highway will be from a national viewpoint, Henry B. Joy, president of the Lincoln Highway Association, addressed the following declaration of plans and ideals to the conference of governors held in Colorado Springs, Col., beginning Aug. 28:

With the authority to plan and the power to execute of the great Napoleon, the Lincoln way might be creditably planned and executed with dispatch from the beginning. Many cities want it to pass their way. Many counties seek that it traverse them, and even great states press for the benefits which will accrue from its passing through.

The idealists who have energetically pressed forward the great project of a Lincoln highway from coast-to-coast have accomplished wonders toward crystallizing a nation-wide demand for the consummation of such a

great and desirable project. A committee of these idealists, after energetically and at their own expense pressing the propaganda to national fame and interest, decided to increase the force behind their efforts, enlist the financial aid of others and thus develop a stronger interest and support of the propaganda.

After much deliberation, they decided to centralize and organize with headquarters at a convenient centre. Some of those whose counsel and enlistment in the work they sought were at first unbelievers—scoffers at such a colossal and impossible project. Be it noted that each and every one approached to aid in forming the permanent association after careful investigation of the merits and possibilities of the project enlisted in incorporating under the laws of Michigan the Lincoln highway, with headquarters in Detroit. The name received finally, out of scores suggested, the unanimous approval of all.

The association then set out to get the consent of all transcontinental highway organizations to the use of the name Lincoln highway. This was willingly conceded in a broad spirit with promises of co-operation and pledges of active support towards whatever might be the trend of the studies and investigations as to route.

Route investigation began. All data were studied and climatic conditions considered. Routes possible and impossible were travelled, and details carefully noted as bearing on the ultimate decision which the Lincoln Highway Association was organized to make as to what route would in its judgment be the most practicable to become the great Lincoln memorial highway.

The Lincoln highway, so selected, if done wisely, will become great. None knows better than those who will assume to select the route that it is not done with Napoleonic authority or power. The force behind the decision will be only the wisdom of it, which it is hoped will give the selection of route the force of Napoleon's dictum. Yes, even a greater force, because it is believed that the route of the Lincoln highway, wisely chosen, will have behind it the patriotic force of the whole people.

The appeals of sections have been heard. The arguments of all interests have been and are being weighed. Shall the Lincoln way be marked on the map from large city to large city? Shall it be from point of interest to point of interest? Shall it be a highway from New York to San Francisco as direct as practicable considering the limitations by nature in the topography of the country?

See America first! With all our force we endorse that sentiment. But a transcontinental highway that would from large city to large city, from one wonder of nature to another, from a memorable battle field to a birth or resting place of a martyr President would indeed be a devious and winding journey in this great America of ours.

It becomes plain that the decision on such a devious and complicated route could not be arrived at in two generations. No concentrated effort could be gained for the execution of the work. It becomes plain that the scope of the work must be within the practicable. It must be such as to immediately upon presentation gain your support and mine.

Then, next, to obtain action, a plan is necessary. To have a plan, decision is necessary. For decision, the hopeless divergence of conflicting interests and opinions must be eliminated, and practical conditions only must be considered. The decision must be confined to one permanent road, across the country, to be constructed first, no matter how desirable others may be and actually are.

Such has become the basic principle guiding the Lincoln Highway Association. It is seeking to decide wisely a matter which must be decided rightly; in order to eliminate the petty hauling and pulling and opposition which would be fatal to the great patriotic work, and which would thus postpone beyond our vision so laudable a project. It seems but yesterday that the Panama canal was begun, and yet almost but tomorrow it will be open to the world. Without dreams the world would accomplish little.



## NATIONAL HIGHWAYS ASSOCIATION.

### Many State Governors Actively Interested in Promoting Its Plans.

In connection with the meeting of the House of Governors in Colorado Springs, Col., last month, it is of interest to note that one of the governing bodies of the National Highways Association, the organization which is advocating the construction of 50,000 miles of national highways by the United States government, is composed of past and present state governors. The board now numbers some 50 men, including the following:

O'Neal, Alabama; Hunt, Arizona; Johnson, California; Ammons, Colorado; Miller, Delaware; Trammell, Florida; Slaton, Georgia; J. M. Haines, Idaho; Ralston, Indiana; Clarke, Iowa; Hodges, Kansas; McCreary, Kentucky; Hall, Louisiana; W. T. Haines, Maine; Goldsborough, Maryland; Foss, Massachusetts; Ferris, Michigan; Eberhart, Minnesota; Brewer, Mississippi; Major, Missouri; Stewart, Montana; Morehead, Nebraska; Oddie, Nevada; McDonald, North Dakota; Sulzer, New York; Craig, North Carolina; Hanna, North Dakota; Cox, Ohio; Cruce, Oklahoma; West, Oregon; Tener, Pennsylvania; Blease, South Carolina; Byrne, South Dakota; Hooper, Tennessee; Colquitt, Texas; Spry, Utah; Fletcher, Vermont; Mann, Virginia; Lister, Washington; Hatfield, West Virginia; Carey, Wyoming; Strong, Alaska; Frear, Hawaii; Colton, Porto Rico, and M. H. Thatcher and Col. Goethals, representing the Panama canal zone.

Already several good roads organizations have amalgamated with this body. The National Oil Trails Association and the Inter-Mountain Good Roads Association have become departments of the national organization and the Ohio Good Roads Federation, the Great White Way Association, the North Carolina Good Roads Association and the Pennsylvania Good Roads Association have become divisions of it.

## ROAD FUND APPORTIONED.

### How the Various Counties in New York Will Benefit from Bond Issue.

John N. Carlisle, state commissioner of highways in New York, has completed the apportionment of the second \$50,000,000, which was authorized in the referendum at the general election in 1912, to be used for the construction and improvement of highways. Under the terms of the vote, \$20,000,000 is available for state roads and \$30,000,000 for county roads, to be apportioned equitably on the basis of population, amount of public highways and the areas of the several counties. These sums have been divided by the commissioner, with the approval of the attorney-general and state comptroller, as follows:

| County       | Apportioned<br>for State | Apportioned<br>for County |
|--------------|--------------------------|---------------------------|
| Albany       | \$427,140.80             | \$640,711.20              |
| Alleghany    | 360,388.80               | 540,583.20                |
| Broome       | 335,741.20               | 503,611.80                |
| Cattaraugus  | 445,184.00               | 667,776.00                |
| Cayuga       | 328,913.40               | 493,370.10                |
| Chautauqua   | 471,615.80               | 707,423.70                |
| Chemung      | 210,981.60               | 316,472.40                |
| Chenango     | 320,997.20               | 481,495.80                |
| Clinton      | 335,462.80               | 503,194.20                |
| Columbia     | 274,557.00               | 411,835.50                |
| Cortland     | 196,653.60               | 294,980.40                |
| Delaware     | 487,713.60               | 718,070.40                |
| Dutchess     | 378,309.00               | 567,463.30                |
| Erie         | 1,113,762.20             | 1,670,643.30              |
| Essex        | 417,931.20               | 626,896.80                |
| Franklin     | 414,109.00               | 621,163.50                |
| Fulton       | 205,458.60               | 308,187.90                |
| Genesee      | 202,593.00               | 303,889.50                |
| Greene       | 227,046.80               | 340,570.20                |
| Hamilton     | 276,780.40               | 415,170.60                |
| Herkimer     | 400,495.20               | 600,742.80                |
| Jefferson    | 557,582.80               | 836,374.20                |
| Lewis        | 331,292.40               | 496,938.60                |
| Livingston   | 253,638.80               | 380,458.20                |
| Madison      | 269,150.40               | 403,725.60                |
| Monroe       | 640,241.40               | 960,362.10                |
| Montgomery   | 188,144.60               | 282,216.90                |
| Nassau       | 300,907.00               | 451,360.50                |
| Niagara      | 294,038.80               | 441,058.20                |
| Oneida       | 593,113.40               | 889,670.10                |
| Onondaga     | 552,841.20               | 829,261.80                |
| Ontario      | 278,783.00               | 418,174.50                |
| Orange       | 423,662.20               | 635,493.30                |
| Orleans      | 163,577.00               | 245,365.50                |
| Oswego       | 392,336.00               | 588,504.00                |
| Otsego       | 391,710.20               | 587,565.30                |
| Putnam       | 96,457.20                | 144,685.80                |
| Rensselaer   | 388,010.80               | 582,016.20                |
| Rockland     | 130,796.60               | 196,194.90                |
| St. Lawrence | 780,977.80               | 1,171,466.70              |
| Saratoga     | 337,699.00               | 506,548.50                |
| Schenectady  | 199,412.00               | 299,118.00                |
| Schoharie    | 232,372.00               | 348,558.00                |
| Schuyler     | 132,433.40               | 198,650.10                |
| Seneca       | 156,522.60               | 234,783.90                |
| Steuben      | 577,806.00               | 866,709.00                |
| Suffolk      | 471,556.20               | 707,334.30                |
| Sullivan     | 350,223.60               | 525,335.40                |
| Tioga        | 201,217.40               | 301,826.10                |
| Tompkins     | 210,735.80               | 316,103.70                |
| Ulster       | 456,570.20               | 684,855.30                |
| Warren       | 263,379.60               | 395,069.40                |
| Washington   | 315,420.80               | 473,131.20                |
| Wayne        | 273,417.20               | 410,125.80                |
| Westchester  | 577,888.00               | 866,832.00                |
| Wyoming      | 217,383.60               | 326,075.40                |
| Yates        | 135,865.80               | 203,798.70                |
| Totals       | \$20,000,000.00          | \$30,000,000.00           |

## EXHIBITORS AT DETROIT.

### Manufacturers and Producers Who Will Make Display at Road Congress.

Plans are progressing favorably for the third annual road congress of the American Highway Association, and affiliated bodies, at Detroit, Sept. 29-Oct. 4. Among the special meetings will be a conference of vehicle makers, horse drawn and motor driven, regarding traffic regulations, having particular reference to the weight of vehicles and tire widths, at the call of George C. Diehl, chairman of the national good roads board of the American Automobile Association. Chair-



man John N. Carlisle of the highway commission of New York State will preside.

A particularly interesting feature of the congress will be the exhibition of road making machinery and materials, in which the following manufacturers and producers will take part:

Acme Road Machinery Company, Frankfort, N. Y.; J. D. Adams & Co., Indianapolis, Ind.; American Car & Foundry Company, Detroit; American Granite Company, Milwaukee, Wis.; American Rolling Mill Company, Middletown, O.; American Steel & Wire Company, Chicago; Austin Western Company, Chicago; Association of American Portland Cement Manufacturers, Philadelphia; Baker Manufacturing Company, Memphis, Tenn.; R. D. Baker & Co., Detroit; Barber Asphalt Paving Company, Philadelphia; Barrett Manufacturing Company, New York City; Bausch & Lomb Optical Company, Rochester, N. Y.; Rudolph S. Blome Company, Chicago; Buffalo Pitts Company, Buffalo, N. Y.; Dolarway Paving Company, New York City; Dunn Wire-Cut-Lug Brick Company, Connecticut, O.; Eureka Machine Company, Lansing, Mich.; Good Roads Machinery Company, Kennett Square, Penn.; Good Roads Supply Company, Detroit; Hastings Paving Company, New York City; Wheeling Mold & Foundry Company, Wheeling, W. Va.; Robert W. Hunt & Co., Chicago; Warren Bros. Company, Boston, Mass.; Chas. Hvass & Co., New York City; Van Duzen, Roys & Co., Columbus, O.; Institute of Industrial Research, Washington, D. C.; Universal Portland Cement Company, Chicago; Iroquois Iron Works, Buffalo, N. Y.; United States Cast Iron Pipe & Foundry Company, Burlington, N. J.; Kent Machine Company, Kent, O.; Knickerbocker Company, Jackson, Mich.; National Paving Brick Manufacturers' Association, Cleveland, O.; Novo Engine Company, Lansing, Mich.; Port Huron Engine & Thresher Company, Port Huron, Mich.; Portsmouth Culvert Company, Portsmouth, O.; Robeson Process Company, Pennington, N. J.; Shannon Self-Locking Metal Culvert Company, Cincinnati, O.; Standard Oil Company, Chicago; Steel Protected Concrete Company, Philadelphia; Tarrant Manufacturing Company, Saratoga Springs, N. Y.; Texas Company, New York City; Thomas Steel Reinforcement Company, Detroit; Trussed Concrete Steel Company, Detroit; United States Asphalt Refining Company, New York City; United States Wood Preserving Company, New York City.

#### LEGISLATIVE BRIEFS.

The license markers in Connecticut during 1914 will carry white letters and figures on a light green background. Instead of a capital C for the state designation, the abbreviation "Conn." will be arranged vertically at the left of the number and the figures 1914 in the same manner at the right.

According to an announcement credited to Robert S. Ross, secretary of the New York State Automobile Association, an attempt will be made to secure the passage of a bill by the 1914 session of the legislature, limiting the weight of truck loads to three tons and to require tires to be of a width proportionate to the maximum weight to be carried.

Montgomery, Ala., has an interesting ordinance, which requires all dealers in gasoline to report to the assistant fire chief daily the names and addresses of customers to whom gasoline has been sold and the amount purchased by each. E. A. Frazer, manager of the Alabama Auto Company's garage, was fined \$10 and costs recently for failure to comply with this provision.

Supreme Court Justice Seabury has vacated the temporary injunctions secured by taxicab companies in New York City against the enforcement of the so-called taxicab ordinance. He holds that the ordinance "must be pronounced a serious and well considered attempt to remedy abuses which have grown to such an extent as to make the application of a remedy imperative." All but one of the companies interested appear to have accepted this decision as final, the exception having established a private taxicab line in an effort to avoid compliance with the regulations.

In order to comply with the new registration law in Pennsylvania, it will be necessary to provide six different classes of license plates. The first class comprises pleasure cars and all others having pneumatic tires; the second, all motor trucks on solid tires, this being sub-divided according to five differing weight classifications, each designated by stars; the third, manufacturers and dealers, carrying an X before the number; the fourth, traction engines, with an E; the fifth, trailers, with a T, and the sixth, motorcycles, with an O.

#### PILOT'S CROSS COUNTRY TRIP.

##### How the Richmond Product Withstood Trials of Indiana-Pacific Tour.

As a result of the performance of the Pilot car, made by the Pilot Motor Car Company, Richmond, Ind., in the Indiana-Pacific tour of the Indiana Automobile Manufacturers' Association, the engineer, who accompanied the tourists, reports there are but slight changes to recommend in the way of improvement. The trip was much harder than was expected, especially through the Colorado mountains and deserts, and the company is much pleased to learn that the strength of its product was such as to meet every road condition encountered. The engineer reports in part as follows:

The trip showed the high quality of tires made by the standard manufacturers, as the Pilot reached San Francisco with the original air in the front tires, placed there at the factory, and we were not obliged to replace the rear tires until the touring party reached Lake Tahoe. In other words, tires gave the full mileage expected in ordinary travel, notwithstanding the difficult road conditions encountered in the trip.

Fuel consumption varied, as would be expected. About eight miles a gallon was obtained in the steep grades in the mountains, and on the ordinary roads 10 to 12 miles a gallon. In a few favored sections, where the roads were exceptionally good, 14 miles a gallon were obtained, which is equal to the best records made by car owners in this vicinity.

On account of the abundance of power in our motor, no trouble was experienced whatever in climbing the steepest grades, even at the highest altitudes, over 11,000 feet, but the trip showed conclusively the great importance and necessity of a carburetor designed especially for the altitudes. A carburetor with an air adjustment from the steering column, which we tried in the mountains, proved of great value.

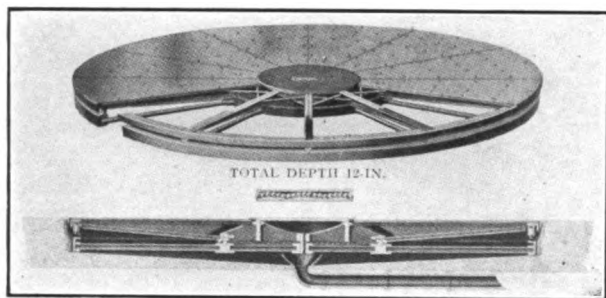
The tour also showed that all cars sent by manufacturers to the mountains and deserts should have spring steel of the very highest quality and strength to withstand the service there, and particular attention should be given to this matter by all manufacturers selling cars in this territory. To the credit of the Indiana built cars which participated in the tour, it may be said there were few, if any, delays on the road on account of the need of replacements or repairs, due to faulty material or construction, and what few delays there were, were largely due to the roads being made impassable at times by cloud bursts, and over some of these roads, even in their bad condition, speed was made, which only drivers with great confidence in their cars would dare to make.

We naturally feel greatly pleased at the showing of the Pilot in making this long journey without mechanical road adjustments, and the tour will enlighten the public and automobile owners throughout the country as to the general excellence of the Indiana made cars, and the reliability and service which may be expected from any of the cars which met the rugged conditions of this trip so efficiently.



## GARAGE AND REPAIR SHOP EQUIPMENT.

**T**HE advantages of turntables in the garage are numerous. Not only do they permit of utilizing all the floor space, but they make for



**Universal Turntable, Having Ball Bearings and Means for Draining, Is Constructed in Varying Capacities.**

safety, in that accidents due to placing the machine in its proper space on a crowded floor are avoided. This is particularly true where the garage is a converted building and of such dimensions as to compel the driver to make many changes of gears in positioning his car. Considerable time is saved through the installation of a turntable not only in entering and leaving the building, but the washer is able to handle the machine without starting up the motor.

The Canton Foundry & Machine Company, Canton, O., manufactures a wide variety of turntables adapted to both public and private service and in various sizes and capacities. One of the features of the Universal design, shown in an accompanying illustration, is the inexpensive foundation required and the means employed to take care of the accumulation of mud, etc., removed from the vehicle in the washing process. The pit is but 12 inches deep, a concrete base, slightly larger than the turntable, and grooved so as to carry all water and debris from the centre to the periphery of the table and into a concrete gutter or drain, which is covered with removable plates.

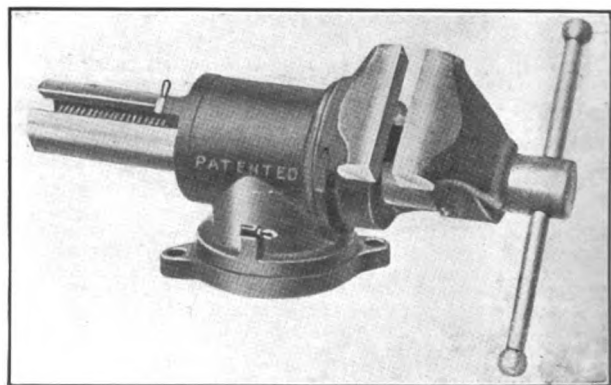
It is held that the Universal operates so easily that it may be turned by a child. This is due to the Serpentine, patented, ball bearing race course, so constructed that foreign elements are prevented from interfering with the movement of the balls. By referring to the lower view in the illustration it will be noted that the top of the table rests on seven balls at the summits, the remaining balls revolving in pockets filled with lubricant. As the table moves the balls at the "high spots" roll and are replaced by others coming up, eliminating friction.

The superstructure is of structural steel built in truss form and reinforced. The top plates are No. 7 gauge steel, securely braced. The table has a checkered iron removable centre with No. 7 gauge steel plates extending to the outer rim, neatly fitted and sloping slightly to provide for proper drainage. The 12 top steel plates are removable and are reinforced by angle irons at proper intervals, firmly riveted crosswise underneath and resting on structural trusses. The table cannot tilt, as the slightest depression throws caster wheels on the outer rim to the rim track.

The Universal is made in 12, 14, 15 and 16-foot table diameters, each having a supporting capacity of 8000 pounds, and 16 and 18-foot diameter tables with capacities ranging from eight to 10 tons for truck service. The company makes a specialty of installations and will submit data and specifications on request.

### F. & R. PATENT VISE.

The Fulton Machine & Vise Company, Lowville, N. Y., is manufacturing the F. & R. patent vise in the machinist's pattern. It has the advantage of two complete swivels, a combination of the two giving the most desirable positions for the use of a mechanic. The vise, which is presented in an accompanying illustration, is locked at any angle by two separate methods. One is by clamping the work within the jaws, which tightens the frictions, the other by the use of the position pins. With both in use it is stated that the vise is positively locked in any position. The



**F. & R. Patent Vise Especially Adapted for Motor Car Repair Work.**

jaws are always held in place, when the work is removed, by the position pins, if the operator requires, by the use of which the vise is made sta-



tionary at any angle. Cast steel faced tempered jaws are utilized. The vise is made with openings varying from two to nine inches and in six sizes, the weights varying from 6.5 to 155 pounds.

### EDWARDS PORTABLE TIRE PUMP.

The Edwards Manufacturing Company, Cincinnati, O., is producing the Edwards portable electric tire pump shown herewith. It is designed both for public and private garages, is simple in design, and throughout the best of material and workmanship are employed. The motor, compressor and tank are mounted on a neat base having three wheels and a convenient handle. The air tank is 12 inches long and six in diameter, and is equipped with a petcock at the bottom, permitting of blowing out any condensation that may exist, also for pumping into the tank direct.

The motor is a .5 horsepower unit, constructed for either alternating or direct current, 110 or 220 volts, 60-cycle, single-phase. The compressor is of the air-cooled type, geared to the electrical unit, with pinions fully enclosed. Eight feet of high grade .5-inch hose with gauge, tank pressure gauge and 20 feet of electric cord and socket are included in the equipment. The switch is located on the motor. Lubrication is provided by means of grease cups on the cylinder and crankshaft bearings. It is stated that the outfit will pump a 34 by four-inch tire from flat to 70 pounds in 90 seconds. The weight of the equipment is 130 pounds. The company issues a catalogue on portable tire power pumps, grinders, drills, etc., which will be forwarded on request.

### NEVER LOOSEN LOCK NUT.

L. L. Swenson, Ottuma, Ia., has invented a lock nut device, termed the Never Loosen, which comprises a split nut having threads for engagement with the bolt threads and adapted for binding engagement on the face of the nut proper, preventing turning of the nut. The locking action is secured by the twisting of the locking nut before the threads are cut. The nut proper is constructed of hardened tempered steel so that when applied to the bolt it will have a tendency to resume its normal shape, thereby locking both the nut and the bolt.

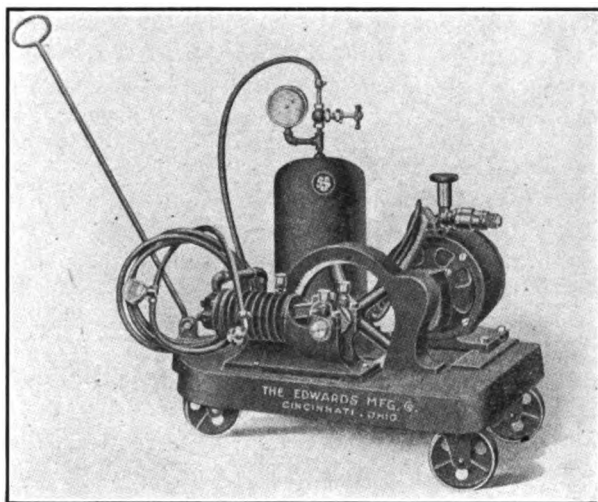
### VULCAN CHAIN PIPE VISE.

J. H. Williams & Co., 150 Hamilton avenue, Brooklyn, N. Y., is manufacturing the Vulcan

chain pipe vise, which is constructed of bright steel throughout and is claimed to be unbreakable. It is also compact in design and may be set up readily for service. It has drop forged steel jaws, tempered for file sharpening. The vise is made in three sizes with pipe capacities of from .125 to eight inches.

### SCHWARZ WHEEL SPIDERS.

The Schwarz Wheel Company, Philadelphia, is now marketing its wheel spiders, enabling repairs to be made by the garageman. They are adaptable for renovating wheels which have a number of spokes broken, thereby saving time and the cost of shipping the work to the factory. The spiders are constructed with the Schwarz patent spoke, and these spokes, turned, finished



Edwards Portable Electric Tire Pump, a Simple and Compact Outfit.

and assembled, form a complete filling for the wheel, with the exception of the felloe. In repairing wheels, it is stated that all that is required is to cut on the round tenons, and put on the old felloe and metal rim. The spiders may also be used in producing new wheels by simply applying new felloes amid the metal rims. The centre hole to be bored by the hub is left blank. The spiders are long enough to accommodate any size of tire. The company carries a full line of spiders adaptable to practically every type of pleasure and commercial vehicle.

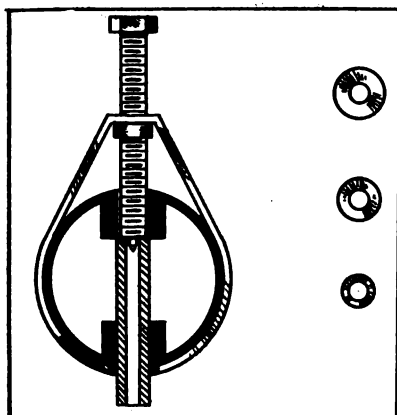
T. A. Goll recently lowered by 1:05:00 the cross country record between St. Louis and Kansas City, Mo. With three other passengers in a Reo the Fifth he covered the distance in 12:55:00, with an actual running time of 11:25:00.



## THE REPAIR SHOP AND THE GARAGE.

### Suggestions for Clamp for Removing Wristpins from Piston--Gear Puller Adapted to Solid and Spoked Wheels--Suggestion for Building Up Bearings.

THE usual method of removing a piston from its connecting rod in the overhaul of the motor is to utilize a piece of brass and a hammer, driving out the wristpin. This is not held to be good practise owing to the walls of the piston being fragile and the possibility of damage through carelessness. In an accompanying illustration is presented a wristpin drawing tool, which was constructed by a driver who cares for several machines utilized by the concern with which he is employed.



Clamp for Withdrawing Wristpins from Piston.

It comprises a clamp as indicated, which is slipped over the piston. The clamp carries a threaded bolt, the end of which is turned down to a point, and engages with the wristpin when this is of the solid type. By using a wrench, a gentle, but considerable, pressure is brought against the wristpin and it is stated that the most obstinate part may be removed without danger of injury to the piston. When constructed for the repair shop several sizes of pins could be turned out to meet varying designs of wristpins, including hollow members.

#### INGENIOUS GEAR PULLER.

Many times it is difficult to draw timing gears, etc., from their shafts owing to the lack of a suitable tool. Sometimes the wheel is lightly constructed with delicate spokes and to attempt to draw the gear with the ordinary tool usually results in buckling or throwing it out of alignment.

In an accompanying illustration is shown a gear puller, the maker of which was awarded first prize in the mechanics' competition conducted by Commercial Motor, an English motoring print.

It is stated by the maker that it will remove a gear without injuring it, as an even pull is obtained at four separate points of the rim when required. This is accomplished by inserting two three-quarter pins through the arms of the top, on which the wheel can be placed.

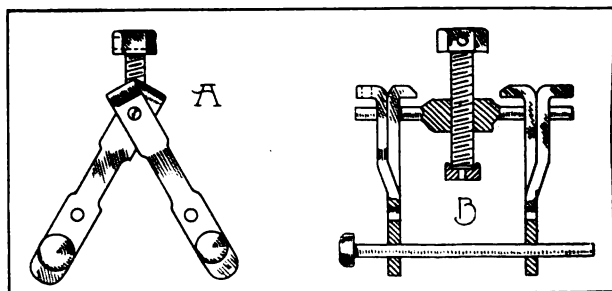
When the gears are solid and will withstand more strain, the other end of the dog, with the bent-over legs is utilized in the usual manner. When the gear has openings the reversible dog may be used as well. One of the features of the device is that it may be taken apart and stored easily.

#### DETERMINING STEEL.

A method of determining self-hardening steel from ordinary cast steel is to hold the metal against a high speed emery wheel. If the color of the spark given off be bright red, it can be taken for granted that the material being ground is cast steel. If it is a dull red, however, the steel is of the self-hardening brand, and the sparks made are very much like those given off from cast iron.

#### BUILDING UP BEARINGS.

The following suggestion is made by a workman, for adjusting the small ends of connecting rods where considerable play exists: Press the bushing out of position in the vise and sweat a layer of solder onto the outside surface. After



An Ingenious Gear Puller: A. Showing Construction of Device; B. How Four Points of Contact Are Obtained.

pressing the part into position again it will be found to be smaller than before and the wristpin can be refitted.



## MERCER AND STUTZ EACH WIN ONE.

**Ralph DePalma Takes the Chicago Automobile Club Trophy the First Day, and Gilbert Anderson the Elgin National the Next at Elgin Road Meet.**

**T**HE contest for supremacy, which has been waged between drivers of Stutz and Mercer cars since the opening of the present racing season, remains the same as though the two 301-mile events at Elgin, Ill., had not been run. That is to say, each make of machine secured a victory, Ralph DePalma in a Mercer taking the Chicago Automobile Club trophy Aug. 29, and Gilbert Anderson in a Stutz the Elgin National trophy, Aug. 30. By the law, which appears to be governing the destinies of these two, it is the Mercer's turn to win the next long distance event. The Stutz took the one just preceding the Elgin events—the Santa Monica road race.

In some respects the contest for the Chicago

was called before he had time to finish. He was out of the running at one time for 15 minutes, while his mechanic and helpers made necessary adjustments. The other competing cars and drivers were: Mason, Rickenbacher; Mercer, Wishart; Nyberg, Harry Endicott; Mason, Mulford, and Mercer, Luttrell.

Apparently there was no doubt of the result after the 10th lap, except that the two leaders contested every inch of the way. The other cars were too far behind to admit of their affecting the final result under any ordinary circumstances. Mulford was forced to retire in the 11th lap, because of being struck in the face by a stone, said to have been thrown by a small boy in a corn



**Ralph DePalma and the Winning Mercer at the Finish of the Race for the Chicago Automobile Club Trophy, Elgin, Ill., Aug. 29.**

Automobile Club trophy. Aug. 29, was very like the second 500-mile race on the Indianapolis speedway, May 30, 1912. It will be remembered that DePalma in a Mercedes led the field in that event almost from the first, with Joseph Dawson in a National close behind him. When DePalma was forced to withdraw on the next to the last lap, Dawson became an easy winner. This time DePalma was at the wheel of a Mercer and Dawson was driving a Delta. There was no withdrawing on the next to the last lap and Dawson was forced to be content with second place.

DePalma's time for the 301 miles was 4:31:56. Dawson finished in 4:39:52. Third place went to William Chandler in a Mason, although the race

field on one of the back stretches. Endicott's machine caught on fire and he was so badly burned that he was taken to the field hospital. The other machines which failed to finish experienced some little trouble because of the poor condition of the road surface on the west stretch, between McQueen's and the so-called graveyard turn.

Although the race for the Elgin National trophy was for the same distance as the contest of the previous day, the result was somewhat more interesting from the fact that all previous records for the course were exceeded. Anderson's Stutz covered the 301 miles in 4:13:38, his average speed being 71.5 mile an hour, as against 62.5



for Mulford's Lozier in 1910, 66.43 for Zengel's National in 1911, and 68.4 for DePalma's Mercedes in 1912. Mulford in a Mason was second this year in 4:20:31, and Wishart in a Mercer, third, in 4:29:58. Wishart also created a lap record of 6:38.

There were 12 starters as follows: William Endicott, Case; Rickenbacher, Mason; Mulford, Mason; Anderson, Stutz; Wishart, Mercer; Haupt, Mason; Dawson, Marmon; DePalma, Mercer; Burman, Keeton; Henning, Velie; Bergdoll, Erwin; Grant, Isotta. William Endicott was the first to get away and Rickenbacher the last. The latter was forced to retire on the back stretch while attempting to pass his teammate, Mulford.

Anderson took the lead on the fourth lap, and maintained that position throughout the remainder of the race. Mulford went into second place on the third lap, but was forced to contest that position with Wishart many times during

| 100 Miles.  |                |         |
|-------------|----------------|---------|
| Stutz.....  | Anderson ..... | 1:22:27 |
| Mercer..... | Wishart .....  | 1:25:43 |
| Mason.....  | Mulford .....  | 1:26:20 |
| 150 Miles.  |                |         |
| Stutz.....  | Anderson ..... | 2:04:33 |
| Mason.....  | Mulford .....  | 2:08:59 |
| Mercer..... | Wishart .....  | 2:09:12 |
| 201 Miles.  |                |         |
| Stutz.....  | Anderson ..... | 2:51:21 |
| Mason.....  | Mulford .....  | 2:53:43 |
| Mason.....  | Haupt .....    | 2:56:32 |
| Mercer..... | Wishart .....  | 2:56:33 |
| 251 Miles.  |                |         |
| Stutz.....  | Anderson ..... | 3:32:39 |
| Mason.....  | Mulford .....  | 3:37:35 |
| Erwin.....  | Bergdoll ..... | 3:40:50 |
| Mercer..... | Wishart .....  | 3:43:15 |
| 301 Miles.  |                |         |
| Stutz.....  | Anderson ..... | 4:13:38 |
| Mason.....  | Mulford .....  | 4:20:31 |
| Mercer..... | Wishart .....  | 4:29:58 |
| Isotta..... | Grant .....    | 4:42:14 |
| Mercer..... | DePalma .....  | 4:47:24 |

Of particular interest in connection with the races over the Elgin road course is the statement of the Bosch Magneto Company, New York City,



Gilbert Anderson and His Stutz Finishing a Winner in the Elgin National Road Race, Aug. 30, After Creating New Record for the Course.

the next four hours. At one time Wishart had dropped back to sixth place, but despite his frequent stops on account of tire trouble he kept Mulford busy.

Harry Grant showed some of his old form, although the Isotta failed to indicate the desired speed to make him a winner. He drove 250 miles without stopping, finishing in fourth place, and was the only driver in the contest to go through with but one stop. DePalma and his Mercer finished fifth. Of the 12 drivers in the race only three were compelled to withdraw, these being Rickenbacher, Burman and Haupt. The positions of the leaders and their times at various stages of the race follow:

| 50 Miles.  |                |       |
|------------|----------------|-------|
| Car        | Driver         | Time  |
| Stutz..... | Anderson ..... | 41:24 |
| Mason..... | Mulford .....  | 43:19 |

that Bosch magnetos and plugs won a complete victory. Not only were the Mercer that won the Chicago Automobile Club trophy and the Stutz that won the Elgin National trophy, thus equipped, but every car to receive the checkered flag at the completion of the race as well. It is believed that this is the first important racing event in this country, at least, where the same ignition equipment was utilized on all cars to finish.

After reassembling the transcontinental Cole, C. S. Crawford, chief engineer of the Cole Motor Car Company, Indianapolis, Ind., drove the machine to an elevation of 4800 feet toward the summit of Mt. Hood in Oregon. It is claimed that Crawford's trip extended about two miles further over this mountain road than ever had been traversed before by automobile.



# CHARACTERISTICS OF HEAVY FUELS.

## Part II—Effect of Varying Control of Four-Cycle Motor on the Mixture and Methods Involving Variation of the Cycle—Carburetion of Light Oils.

IN THE previous installment reference was made to the result of varying the control with a four-cycle motor and its effect upon the mixture within the cylinder walls, it being stated that varying the amount of the charge and compression was to vary the temperature of compression.

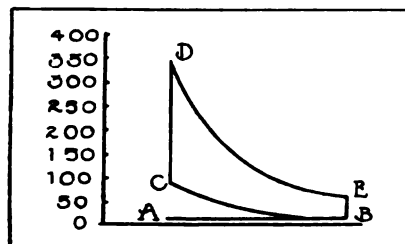


Fig. 3—Indicator Card of Ideal Engine.

To properly understand that which takes place in the cylinder of a four-cycle engine the indicator diagram at Fig. 3 will be of service. It provides a convenient means of showing what occurs within the cylinder during operation, and its name is derived from the fact that such diagrams can be drawn mechanically for real engines by means of an instrument called an indicator. Such diagrams are very useful to the engineer.

### Pressure-Volume.

The diagram referred to is for pressure-volume, and in the explanation it is assumed that the substance in the cylinder is air. At the start of the cycle the piston has completed the firing stroke and is about to begin the intake or suction stroke. The clearance space between the piston and the cylinder head is filled with burned gases (products of combustion), and the pressure is atmospheric because the cylinder has been in communication with the atmosphere through the exhaust valve, now closed. The condition at this time is shown in the diagram by the point A, which is at a horizontal distance above the vertical axis representing the atmospheric pressure of 14.7 pounds a square inch.

Upon the piston making its stroke (intake) the cylinder is in communication with the outside air and the pressure within it remains atmospheric throughout. The intake is represented on the diagram by the line A-B, which is at the constant height representing the atmospheric pressure, and its length represents the volume of the charge taken in, which is the same as the volume through which the piston moves. The point B represents the condition at the end of the in-

take stroke. Both the intake and exhaust valves being closed the air cannot escape and during the compression stroke is crowded into a smaller volume, while its pressure rises. This continues until the stroke is completed and the charge is compressed in the clearance space, a process represented by the line B-C, which shows the rise in pressure resulting from the compression. A compression of this kind, occurring without the addition of heat to or its subtraction from the gas, is called an adiabatic compression. It is a process similar to that which takes place in the operation of a tire pump, and which causes its rise in temperature.

### Cylinder Pressures.

When the charge attains the point indicated by C, it is ignited, and the heat generated by the explosion raises the temperature and consequently the pressure of the mixture. The combustion occurs so quickly that the piston has not time to start on the next stroke (firing) before the combustion is completed, and the rise in temperature occurs as shown by the line C-D, while the volume of the gas is constant. The products of combustion actuate the piston, and expanding behind it, fall in pressure. This expansion taking place without communication to or from the gas, is adiabatic expansion, and is accompanied by a fall in the temperature of the gas.

The expansion curve D-E is similar to the compression curve B-C. At the point E the stroke is completed and further expansion is not possible. Upon the exhaust valve opening the pressure within the cylinder falls to atmospheric, as indicated by the line E-B.

The diagram, therefore, shows the series of pressure and volume changes taking place in a gas engine, and is such as would be taken by an indicator from a perfect engine. The area B, C, D, E, represents the work done a cycle. The rise

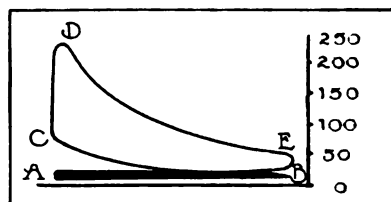


Fig. 4—Indicator Card from Otto Cycle Engine.

in temperature during the explosion depends on the amount of heat that is generated, also on the strength of the mixture and the heat of



combustion of a cubic foot of the fuel.

The above deals with an ideal engine, but there are differences between it and the practical or real engine, occurring in each part of the cycle. During the intake (Fig. 4, line A-B), the pressure in the cylinder is



Fig. 5—Indicator Card with Weak Mixture.

approximately a pound or more below atmospheric pressure. The mixture is also heated by contact with the walls of the cylinder and with the hot gases remaining in the clearance space. The compression is not adiabatic, because it takes place in a cast iron cylinder, which absorbs heat from the gas while it is being compressed and thus makes the final pressure and temperature less than that calculated on the assumption of adiabatic expansion, although it is held that the difference is not generally very great.

The combustion is neither instantaneous nor complete. With weaker mixtures the explosion becomes slower and less complete, as indicated at Fig. 5, until with the weakest the process is one of slow combustion taking place practically throughout the period of expansion. Some of the charge may still be unburned when the exhaust occurs. The expansion curve is above adiabatic in motors because the cylinder walls that have been heated by the explosion give back some of the heat to the gases, and also because the combustion continues and liberates more heat. This last effect is more noticeable when the mixture is weak.

While the above discussion may appear foreign to the subject of heavy fuels, it has an important bearing, however, as was pointed out in the opening paragraph of this article.

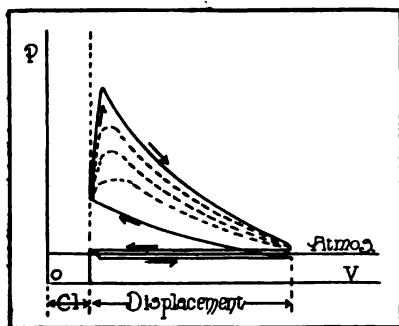


Fig. 6—Indicator Diagrams for Quality Governing.

demand is termed governing, a function that may be further complicated by the addition of other requirements than the maintenance of a balance

between the energy generated and that demanded. Thus it may be necessary to be able to operate at various speeds while maintaining the above balance, as with the automobile engine. In most stationary engines it is desirable to maintain an approximately constant speed regardless of the power demand; that is, the speed of rotation must generally be approximately the same at all loads. The balance between supply and demand may be obtained manually as with the automobile motor, automatically by suitable mechanism as in the ordinary power engine, or by a combination of these two methods.

The power made available in the cylinder of an engine is dependent upon the net work supplied to the piston by the working substance a cycle and the number of cycles performed in a unit of time. To vary the power made available it is possible to vary the net work supplied the piston a cycle or the number of cycles a unit of time, or both. With the number of cycles a unit of time remaining constant, the power made available may be varied

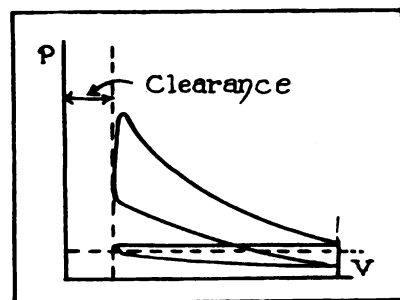


Fig. 7—Indicator Diagram for Quantity Governing.

by changing the work done on the piston a cycle; that is, by changing the work value of a cycle. This may be accomplished by changing the relative proportions of the fuel and air, known as quality governing, or by changing the weight of constant quality mixture drawn into the cylinder a cycle, which is known as quantity governing.

#### Quality Governing.

Since the internal combustion motor is a heat engine, the amount of work which it makes available in a given time must, in a general way, be proportional to the heat energy supplied it; that is, the quantity of fuel in that time. It follows, therefore, if the energy is to be decreased, it is only essential to decrease the amount of fuel burned a cycle, while an increase in the supply will augment the energy, provided, however, sufficient air be present to burn it all.

A series of indicator diagrams is presented at Fig. 6, these showing the variation in size accompanying a variation in the fuel supply. The area of each cycle is proportional to the work done on the piston during that cycle, and, therefore, is a measure of the power made available. The largest diagram corresponds to the rated load, with



approximately the maximum proportion of fuel in the mixture. The smaller diagrams express smaller loads and proportions of fuel, or, as it is

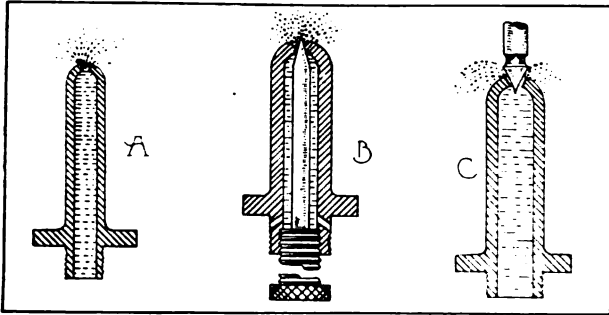


Fig. 8—Forms of Spray Nozzles: A, Fixed Orifice; B, Adjustable; C, Same with Inverted Needle.

commonly termed, leaner or weaker mixtures.

It will be seen that the compression pressure remains the same for all cycles, indicating that a full charge is drawn in at all loads. Any diminution in the fuel supply is balanced by a corresponding increase in the air supply. Theoretically this is held to be advantageous, as the efficiency of the Otto cycle depends on the terminal compression pressure if the initial pressure remains constant. From a theoretical viewpoint this method of governing should provide a constant efficiency for all loads. Practically, this is not true because as the mixture becomes leaner it burns more and more slowly, as is indicated by the gradual tipping of the combustion lines in the diagram. This results in a greater loss to the jacket water at fractional loads, and ultimately to the exhaust of incompletely burned charges at very slight loads. The efficiency therefore decreases as the load decreases.

#### Quantity Regulation.

When operating at a full load an internal combustion engine draws into its cylinder enough air to practically burn the fuel charge. In quantity regulation this quantity is increased when the amount of fuel is decreased to obtain the fractional loads. Therefore, with that method there is enough air present at all but the maximum load and a slower burning mixture results. In the quantity regulation this is obviated by decreasing the air supply with the fuel so that the mixture is in practically the same proportion for all loads, but varies in quantity to meet the requirements.

The variation is generally effected by throttling the entering charge or mixture and Fig. 7 shows a diagram with straight throttling. Theoretically, the efficiency of engines governed by the quantity method should decrease as the load decreases, because of the decreasing

compression pressure, which would cause slower burning of the charge. Practically the efficiency falls for this reason and also because of the increasing negative work of the lower loop of the diagram, which grows larger as the throttling increases.

It has been shown that it is desirable to maintain proper proportions of fuel and air at all loads and that as the load increases against the engine a more powerful explosive charge is necessary. It would appear that the construction of a carburetor for heavy fuels would be simply a problem of fuel and air proportion, and some designers have been working along these lines, believing that a perfected gasoline carburetor plus an effective vaporizer would enable kerosene to be utilized on automobiles with the same degree of perfection as gasoline. It is held by engineers abroad where considerable experimentation has been conducted in heavy fuels, that this is not possible; that there are factors which do not coincide with gasoline carbureting practise; that more or less trouble is experienced, including visible exhaust, in varying the speed and load. These will be discussed in logical sequence.

A brief review of the methods utilized for obtaining an explosive mixture with gasoline as a fuel will be of value to the reader not familiar with the principles of carburetion, in showing some of the difficulties being experienced by designers of heavy fuel carburetors.

It has been explained that to obtain an explosive mixture of a liquid fuel it is first necessary to convert the fuel into a vapor. The lighter distillates, gasoline, etc., are easily vaporized, but the heavier, including kerosene, are more difficult. With the lighter oils the device for vaporizing the fuel is termed a carburetor, that for the heavier liquids a vaporizer, and throughout this discussion this distinction will be observed.

The vaporization of gasoline is effected by bringing the current of air that is on its way to

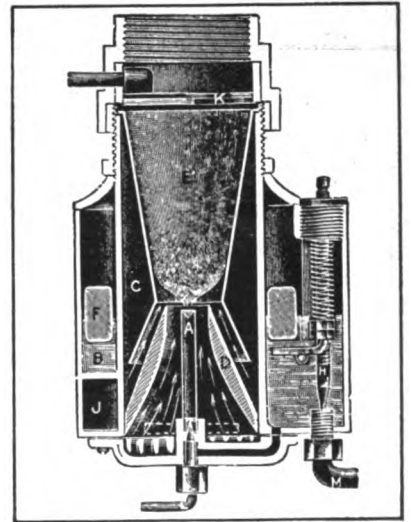


Fig. 9—Concentric Type of Spray Nozzle.



the cylinder, over, through, or in some other manner into intimate contact with the fuel. A given amount of air will take up an amount of gasoline which depends on the nature of the distillate, temperature of the air and fuel, and the humidity of the air. When the air has taken up its charge of gasoline, it is said to be carbureted. The lighter (and more volatile) the fuel, the more of it will be vaporized by a given volume of air. These factors were discussed in the previous installment and supplemented by tables.

Gasoline is a mixture of many components, and upon the passage of air over a surface of the fuel, the more volatile components vaporize first, leaving a residue which becomes denser and denser and which gives off vapor at a constantly decreasing rate. This selective evaporation is not desirable. The vaporization of gasoline, like that

and gasoline is brought into contact, these including the surface, bubbling and spray or jet. There is also a type termed the puddle carburetor. In the surface device air is made to pass over a gasoline surface or an extended one wetted with the fuel. The most common form is a wick or flannel carburetor. The air in coming into contact with the gasoline and wetted surfaces becomes saturated with vapors. The objections to this type are: Selective evaporation and cooling of the mass by the vaporization. A device in which the air in its passage to the cylinder is made to pass through the fuel is termed a bubbling carburetor.

With the spray type the amount of gasoline required during one intake stroke of the cylinder is sprayed into the entering air. It is partly vaporized and partly atomized, and enters the cylinder as a vapor and a liquid. Being separated from the main body of fuel there is no cooling action on the mass of gasoline, and no alteration in its composition by selective evaporation. If the fuel chamber be heated it is to increase the volatility.

The spraying occurs when air is being drawn into the cylinder by the suction of the piston (intake stroke). The spraying nozzle may differ as to shape as will be noted by reference to Fig. 8, which depicts conventional types. That at A has a fixed orifice, being a plain, cylindrical, hollow tube with a choked opening. With this design the quantity of fuel discharged may be said to be fixed. The amount of fuel sprayed into the incoming air may be regulated by the addition of adjustable needle as illustrated at B. The needle may be inverted as indicated at C. The supply of fuel is so regulated that its height is just below the tip of the spraying nozzle and the last named is located in the air pipe leading to the cylinder of the engine, as shown at A, Fig. 9, and C, Fig. 10. The diameter of the pipe is often restricted or reduced—a construction termed a Venturi tube—being utilized to increase the velocity around and above the nozzle; thus decreasing the pressure and making a greater head available for causing flow.

During the suction (intake) stroke of the cylinder the pressure within the air pipe is reduced below that of the atmosphere, and the air rushing past the nozzle creates an additional slight pressure drop immediately opposite the end of the latter. This double reduction of pressure opposite the end of the nozzle causes a small jet of gasoline to be discharged in the air current by atmospheric pressure on the liquid surface in the reservoir. With throttle governed engines the valve may be so placed as to control the quantity

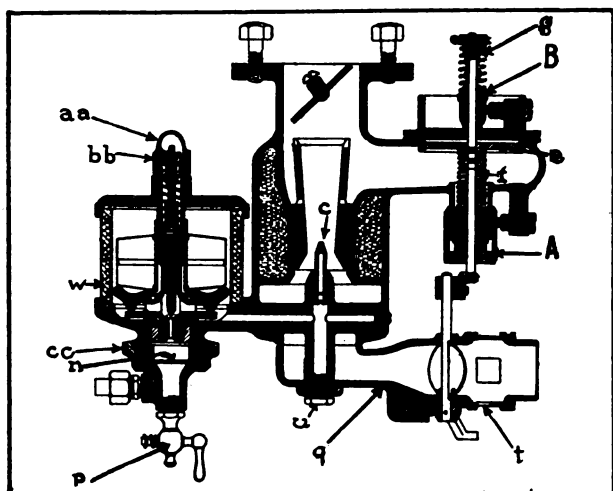


Fig. 10—Showing Location of Spraying Jet C in Conventional Type of Carburetor.

of water or of any other liquid, requires the addition of heat; that is, the so-called latent heat of vaporization. With gasoline the amount necessary is small, and can be taken from the air being carbureted without reducing the temperature of the latter to an abnormal value. If, however, the air is initially at a very low temperature, as in cold weather, its temperature just beyond the nozzle of the carburetor may be reduced to a very low value and trouble may be experienced; the air may not be able to give up enough heat to vaporize all the fuel it has drawn out of the nozzle, or the temperature may get so low as to cause precipitation. These factors are overcome in practise by utilizing the heat of the water jacket and exhaust.

#### Types of Carburetors.

Carburetors utilized may be divided into three classes according to the method by which the air



and velocity of air flowing through the carburetor and indirectly the amount of fuel and air. Spraying types of carburetors are constructed with double jets and with fixed as well as auxiliary air, because the speed and load of the automobile engine changes and the same setting of the needle will not give the same quality of mixture due to the wide variation in the suction effect on the nozzle accompanying wide variation of the quantity, and hence the velocity, of air flowing past the nozzle. With multiple-jet carburetors the object sought is to have one or both operative as conditions require and the auxiliary air is employed to maintain the proper proportions of fuel and air at high engine speeds.

(To Be Continued.)

Ed. Note—The next installment will deal with the difficulties in using kerosene when the speed and load of the engine are varied, as in operation.

### HOW COLE WITHSTOOD TRIP.

#### Car Completely Dismantled After Cross Country Drive to Pacific Coast.

Shortly after completing a run from Indianapolis, Ind., to San Francisco, Chief Engineer Charles S. Crawford of the Cole Motor Car Company, Indianapolis, dismantled the test car in which he arrived on the Pacific Coast coincidentally with the tourists of the Indiana Automobile Manufacturers' Association. The result of his examination is given as follows:

Examination of the spark plugs showed them to be well covered with carbon, but still capable of doing their full work, in good firing condition and a readjustment of their points unnecessary. The starting switch was examined for arcing effects in the circuits and their condition was vouched for by a well known electrical expert, who stated that they did not look as though an electrical current had ever passed through them.

The cylinders, when removed, were found to still retain the original machine marks and showed no appreciable wear, the piston rings showing a true seat for their full width and length and with an entire absence of dark spots on them. The compression chamber of the cylinders and the piston heads were found covered with a carbon deposit which was of a sooty nature and perhaps a 32nd of an inch in thickness. This was easily removed with a rag and no scraping tools were found necessary. All intake valves had a bright polish on the seat, although the edges of the parts had a heavy carbon deposit. The exhaust valves showed no head color, which proves the fact that the valves are amply water jacketed. It is incontestably proven that tungsten steel, used in the valves, is immune from any warping or pitting.

Naturally the various bearings came in for the greatest scrutiny. All crankshaft and connecting rod bearings, despite the fact that these bearings had been given a clearance of .0001 inch above normal before leaving Indianapolis, were in splendid condition. Every effort was made during the trip out here to pound or burn out these bearings, but without result.

The brakes are still in good serviceable condition and ready for many more thousands of miles of usage. The pressed steel gasoline tank, which many times in the

muddy districts supported the complete weight of the rear end of the car, shows no ill effects from its extraordinary abuse.

The carburetor, while completely covered with sand and mud, was in good condition. Exterior cleaning was its only want. The dissection of the entire car revealed the fact that not one bolt, nut, cotter or any part had become loosened or that any part was not performing its function in a most creditable manner.

### KEROSENE BURNING CARS.

#### Report Concerning Henderson Cars in Recent Indiana-Pacific Tour.

As is more or less well known, R. P. Henderson, designer of the Henderson car, and Ray Harroun, inventor of the kerosene carburetor, adopted by the Henderson Motor Car Company, Indianapolis, Ind., as optional equipment on 1914 models, drove two of these kerosene burning machines on the recent Indiana-Pacific tour of the Indiana Automobile Manufacturers' Association. Each car carried five passengers, and the fuel cost a passenger figured out at \$6.50, according to Mr. Henderson.

He states that he found kerosene increased the motor's efficiency, this being due, as he expresses it, to the fact that the new fuel has a higher heat unit than gasoline. He says the explosive power is no greater, however. He holds that it took less kerosene vapor than gasoline in the cylinders, and that the new fuel prevented the formation of carbon deposits. He says:

In one spot we drove 25 miles on second gear, owing to poor road conditions. That meant the motor was revolving about three times as fast as on high gear, yet at this speed the kerosene was turned into vapor just as effectively as at slower speed. The problem of vaporizing kerosene is the thing that barred it as a fuel previous to our success.

In the higher altitudes, where the average motor car loses two per cent. of its power for every 1000 feet upward it travels, our cars showed no loss of power whatever. At 12,000 feet the average car loses 25 per cent. of its power. We have driven in high altitudes before and have measured power loss accurately, but we were surprised to find no such occurrence on this occasion.

Henry J. Adams, Cleveland, O., driving a new Reo the Fifth touring car, made by the Reo Motor Car Company, Lansing, Mich., recently completed a 684-mile trip around Lake Erie, by way of Buffalo, St. Catharines, Detroit and Toledo, in 20:31:00, actual running time. There were four in the party and they were delayed 2:33:00 in securing a Canadian license, in crossing railroads, by traffic holdups, punctures, etc. The motor was not stopped during the entire 23:04:00. It will be noted that the actual running time figures out at an average speed of approximately 33 miles an hour.



## IN THE REALM OF THE MOTORCYCLIST.

### United States Army Adopts the Two-Wheel Mount--Henderson Model for 1914--- New Machines from Omaha and Harrisburg---Sliding Sleeve Engine.

**A**FTER several tests in which every available means of communication between the different divisions of the army were used, the United States government announces that the second division of the reorganized army now stationed at Galveston and Texas City, Tex., has decided upon the motorcycle as the most efficient and has ordered a number of machines for use in this service.

One of the tests made in this connection was the delivering of an order from the division headquarters to the various brigade commanders. The distance was about five miles. Wireless instruments were provided and the message was sent in this way. Another message was sent by tele-

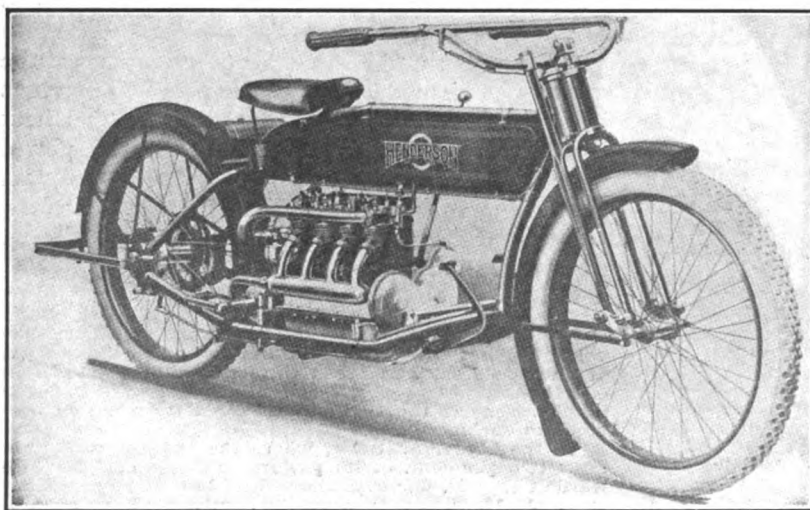
go. Some little confusion has resulted because of the fact that the chairman of this committee has been a New York City man for so many years, but it is anticipated that riders and others having business with the committee will soon become accustomed to the change.

#### New Henderson Model.

While the Henderson Motorcycle Company, Detroit, has not made public the details of the two-speed feature with which the Henderson four-cylinder models for 1914 are to be equipped, the other changes do not indicate a radical departure from former practise with this company. The motor remains the same in general design, but each piston has been lightened by three ounces, which is expected to result in increased speed and flexibility. The cam gears are to be made of steel, and the crankshaft and connecting rod bearings will be of bronze, with babbitt metal linings. The saddle position has been lowered an inch and special provision has been made to enable the rider to adjust the saddle spring tension to suit his weight. The friction surface of the clutch has been nearly doubled and the band brake has undergone such modifications that it is expected to act more effectively. The spring fork has been made heavier, and accompanying this is the use of a drop forged steel frame head that has been specially reinforced to give added strength and riding comfort.

#### Flescher Flyer from Omaha.

Louis Flescher, a pioneer motorcycle man in the West, is organizing a company in Omaha, Neb., for the production of the Flescher Flyer, a nine horsepower twin. The motor will be a De Luxe. The frame will be constructed of 1.25-inch tubing and the compound spring fork will be of special design, in which a light spring is utilized to take up the shocks before the larger spring comes into action. One of the chief features is the use of a drip feed lubricating device by which through a lever connecting with the saddle the oil is turned on when the rider seats himself on



**Henderson Four-Cylinder Model for 1914 Will Be Fitted with Two-Speed Device.**

phone over ground wires which had been laid previously. A third was delivered by an orderly mounted on horseback, and a fourth was relayed by "wigwagging." None of these messages reached its destination so quickly as the one carried by an orderly mounted on a twin motorcycle.

#### Competition Committee Headquarters.

John L. Donovan, Chicago, who was appointed chairman of the competition committee of the Federation of American Motorcyclists by President Patterson, immediately after the latter's reelection at the Denver convention, announces that the new headquarters of his committee will be located in room 819, Ashland building. Chica-





Gustav V. Harn, Secretary-Treasurer, Milwaukee Cycle Supply & Sales Company, Merkel Representative in Milwaukee, Wis.

the saddle, and is cut off immediately the rider leaves the seat. The drive will be by Spartan V belt, through an Eclipse clutch, which is operated by the left hand grip. The throttle is controlled by the right grip, and the spark advance by a lever attached to the tank on the left side of the machine. A special patented muffler is fitted, which is claimed to give a very quiet exhaust without back pressure.

#### Slide Valve Motorcycle Engine.

The Goby Engine Company, Cleveland, O., is working on a sliding valve motorcycle engine, which has a single sleeve located outside the combustion chamber. Christian Goby, president of the Perfection Spring Company, is said to be responsible for the design, which bears his name. The manager of the company is Thomas J. Fay, well known as a mechanical expert.

#### Merkel Is Columbus Champion.

Ray Snyder took the Columbus championship race at Columbus, O., Aug. 25, while riding a Flying Merkel machine. Carl Goudy on an Excelsior finished a winner in the 100-mile event, with Taylor on a Flying Merkel second. The summary:

Five miles, amateur—First, Wooley, Indian; second, Hills, Merkel; third, Woodland, Indian; time, 5:05.2.

Ten miles, professionals—First, Perry, Excelsior; second, Goudy, Excelsior; third, Birkenbach, Thor; time, 8:37.8.

Five miles, sidecars—First, Shepard, Indian; second, Doloff, Indian; time, 6:33.

Five miles, Columbus championship—First, Snyder, Merkel; second, Birkenbach, Thor; third, Hare, Indian; time, 4:36.8.

One hundred miles—First, Goudy, Excelsior; second, Taylor, Merkel; third, Hare, Indian; time, 92:00.

#### Results at Marion, Ind.

Six events were run off on a poor surface at the half mile dirt track, Marion, Ind., Aug. 24. The results follow:

Five miles, novice—First, Smith, Merkel; second, Shimer, Indian; third, Warner, Excelsior; time, 7:24.4.

Five miles, professional—First, Lee, Indian; second, Thompson, Indian; third, Tennant, Merkel; time, 6:51.

Ten miles, county race—First, Keckman, Indian; no others finished; time, 14:25.6.

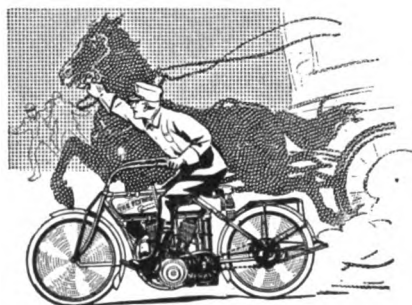
Five miles, professional—First, Culp, Excelsior; second, Thompson, Indian; third, Neukon, Indian; time, 6:39.

Fifteen miles, professional—First, Goudy, Excelsior; second, Thompson, Indian; third, Culp, Excelsior; time, 20:05.4.

Twenty-five miles, professional—First, Culp, Excelsior; second, Neukon, Indian; third, Goudy, Excelsior; time, 34:56.2.

#### Merkel's Branch Factory Opened.

All the machinery at the plant of the Miami Cycle & Manufacturing Company's plant in Middletown, O., which will be utilized in the manufacture of Flying Merkel engines at its commodious branch plant in Indianapolis, Ind., has been installed in its new home. Power was turned on the new factory Sept. 2 and President K. R. Jacoby expects that deliveries of 1914 machines will be begun during the month of September.



## ALWAYS READY FOR ANY EMERGENCY!

With its ability to pick up speed quickly—(60 miles an hour from a standing start within a city block)—the 1913 Flying Merkel Motorcycle is always ready for instantaneous use. These features and the fact that the Flying Merkel Motorcycle is the most economical in the world to operate has led to its universal adoption by Police Departments, Park Boards, Gas Companies, Telephone and Electric Light Companies and all other business concerns and individuals whose requirements demand a sturdy, reliable motorcycle at the minimum cost of upkeep. Remember, the Flying Merkel

"Made Its Name on Merkel Mileage."

Free Art Catalog on Request.

## The Miami Cycle & Mfg. Co.

320 Hanover St.

Middletown, Ohio, U. S. A.

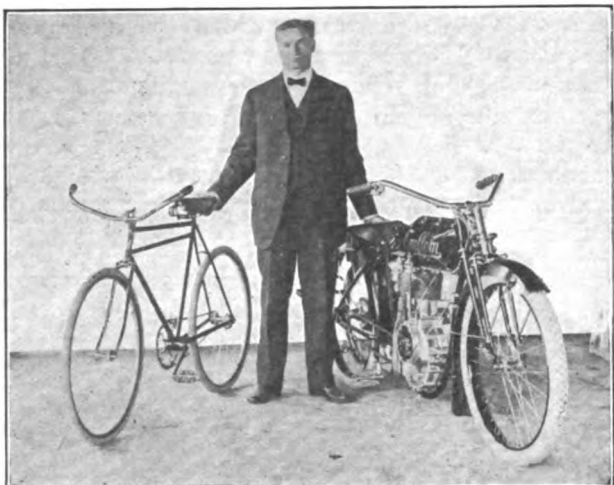


### Los Angeles Joy Ride.

The fifth annual run of the Los Angeles Motorcycle Club to Venice was a veritable joy ride from start to finish. About 1700 riders from all sections of southern California took part in the event, the various makes of machines being represented somewhat as follows: Thor, 139; Excelsior, 109; Harley-Davidson, 87; Merkel, 39; Pope, 19; R-S, 16; Minneapolis, eight; Henderson, seven; De Luxe, six; M-M, six; Pierce, five; Monarch, five; New Era, three; Thiem, three; Wagner, two; Eagle, two.

### Hendee Buys Estate.

George M. Hendee, president of the Hendee Manufacturing Company, Springfield, Mass., maker of Indian motorcycles, has purchased an estate of about 200 acres at Suffield, Conn., which he will convert into a country retreat. The pur-



W. G. Schack, General Manager, Emblem Manufacturing Company, Displaying a Portion of the Emblem Line.

chase was made from six persons at an outlay of \$40,000. The tract is heavily wooded, but Mr. Hendee is to breed pedigreed birds and game. His residence will overlook the Connecticut river, Wilbraham hills and Mount Tom on the north and the Connecticut plain far to the south. It will be one of the finest estates in that part of the country.

### Woman's 65,000-Mile Journey.

One of the longest motorcycle trips ever undertaken by a woman is that of Mrs. Harry Humphreys, champion long distance rider of England. The route scheduled for the trip covers 65,000 miles and contemplates a visit to every capital of the world. Mrs. Humphreys has completed the first leg of the journey, having crossed from San Francisco to New York, from which point she sailed for London. An average of 200

miles a day was maintained on the cross country journey. The tour is in the nature of an endurance test of machine and rider, and if Mrs. Humphreys succeeds in completing the trip within two years and arrives back at San Francisco in time for the opening of the Pan-American exposition in 1915, she will be awarded the sum of \$10,000.

### No F. A. M. Meeting at Brooklyn.

A majority of the board of directors of the Federation of American Motorcyclists has voted against the proposed Brooklyn meeting of the national assembly, denying its legality. Since the meeting was first proposed, Secretary G. B. Gibson has contended that a notice of 30 days was required, as with all national assembly meetings. Legal advice was secured and in conformity with this the foregoing action was taken.

### Balke Made New Track Record.

The recent two-day meet at Rockland, Ill., held by the Rockland Motorcycle Club, was a decided success and resulted in some fine racing. Balke, the Indian rider, reduced the track mile record from 52.5 to 52.4 and was the only rider to cover the course in that time.

### To Produce Gerhart Machine.

The Gerhart Motorcycle Company has been incorporated in Harrisburg, Penn., and it is stated that the concern will erect a factory at Paxtang, near that city, for the production of Gerhart machines. It is understood that modern machinery will be installed and that the plant will be operated by electric power. Charles Gerhart is president of the company, which has located temporary offices in the Bergner building, Harrisburg.

### Make Severe Hill Test.

That the motorcycle does not fear to go up grades generally avoided by automobiles was demonstrated in Marshalltown, Ia., recently, when two machines went to the top of one of the steepest hills in that vicinity. One mount carried six persons and the other five.

### Long Distance Motorcycle Vacations.

Harvery Bernard and John Purdy of Chicago recently completed a 1200-mile vacation trip between Denver and Chicago, utilizing a single-speed, eight horsepower machine with sidecar attachment. Clarence Martin of Milwaukee, Wis., has arrived in Boston, Mass., on a similar vacation trip.

### F. A. M. Pays Another Reward.

Secretary-Treasurer G. B. Gibson of the Federation of American Motorcyclists, has paid another reward of \$25 for the apprehension of a motorcycle thief. Edward Nelson of Aberdeen, S.



D., had his machine stolen June 15. It was recovered by Edwin Voss of Peoria, Ill., and the thief was arrested, tried, convicted and sentenced. The regular affidavit having been received by Dr. Gibson the check was mailed to Voss last week.

#### On a Motorcycle Honeymoon.

An accompanying illustration presents Mr. and Mrs. Harry W. Long of Napoleon, O., who are enjoying a honeymoon trip throughout the East on a Flying Merkel machine. Mr. Long formerly was a racing rider, but is now a leading motorcycle and bicycle dealer. He has a sidecar, but Mrs. Long much prefers to ride tandem. On their way East they spent two or three days as guests of C. R. Miller, superintendent of the Merkel plant in Middletown, O.

#### Hollister Wins Long Race.

Tracy Hollister recently won the 112-mile road race from La Grande to Baker City, Ore., riding a six horsepower Merkel machine, made by the Miami Cycle & Manufacturing Company, Middletown, O. The course was uphill the entire distance with considerable sand. Hollister's time was 3:42.

#### Races at La Porte, Ind.

Twenty-five hundred people witnessed the Labor Day races at La Porte, Ind. Joseph C. Smith acted as referee, Lewis Paul as starter, C. Holloway as announcer, Jay Kanney, Carl Kanney and L. E. Henning as timers, and Oscar Wiegart, Charles Gropp and Edward Schultz as judges. The results follow:

Three miles, amateur—First, Alfred Sage, Indian; second, Carl Long, Indian; third, Fred Knoll, Excelsior; time, 4:30.

Five miles, open—First, Harry Rowe, Thor; second, Eugene Culp, Indian; third, William Goudy, Indian; time, 6:33.

Eight miles, open—First, Goudy, Indian; second, Brier, Thor; third, Culp, Indian; time, not given.

Five miles, amateur—First, Goudy, Indian; second, Rowe, Thor; time, not given.

#### Motorcycle Saves Life.

While riding beside the railroad tracks near Visalia, Cal., S. J. Allpoz saw a man sleeping between the rails, when the headlight of an approaching freight train came into view. Putting on full power, Allpoz forged ahead and jumped from his machine just in time to pull the man to safety.

#### Club Notes, Here and There.

Indian riders in Troy, O., have formed the Indiana Motorcycle Club with a charter membership of 22.

The Galesburg Motorcycle Club, Galesburg, Ill., has elected the following officers: President, Fred Hutton; vice president and secretary, Lee Wright; treasurer, Fred Wiedenhammer.

The North Shore Motorcycle Club, Chicago, is laying plans for an endurance run the latter part of September and a hill climb early in October.

The St. Louis Motorcycle Club and the South Side Motorcycle Club, both of St. Louis, Mo., have consolidated under the former name.

The Crookston Motorcycle Club has been organized in

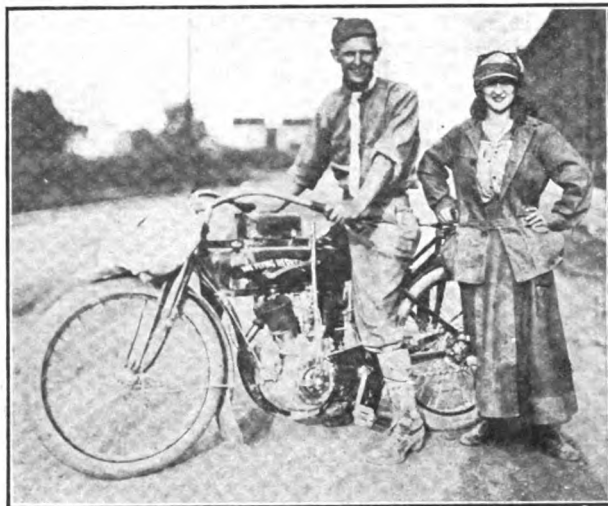
Crookston, Minn., with the following officers: President, Howard Palen; vice president, Arno Lawrence; secretary, Algot Eck; treasurer, Dewey Kiewel.

Sheldon Sturges, Dwight Williams and Harold Bergh of New Haven, Conn., each mounted on an Indian, recently took a 530-mile outing to Atlantic City and return.

The Wichita Motorcycle Club, Wichita, Kan., recently held a sociable run, in connection with which prizes were awarded as follows: Get-away race, H. Stephens, Indian; sand-pulling contest, Ray Ellis, Pope; race around a city block, E. Swigart, R-S; 10-mile road race, H. Stephens, Indian.

The Evansville Motorcycle Club, Evansville, Ind., has petitioned the common council to repeal the ordinance recently passed forbidding tandem riding in that city.

The following clubs have affiliated with the Federation of American Motorcyclists recently: Twin City, Norfolk, Va., F. T. Ayers, secretary; Beloit, Beloit, Wis., R.



Mr. and Mrs. Harry W. Long, Napoleon, O., Who Are Enjoying Their Honeymoon on a Flying Merkel.

G. Talbot, 107 West Grand avenue; McPherson, McPherson, Kan., Leslie Enoch, 2125 North Main street.

The Lincoln Motorcycle Club, Lincoln, Neb., which was reorganized in April, has outgrown its present quarters and has secured additional room at 215 Fraternity building. The club now numbers some 80 members.

The Indianapolis Motorcycle Club, Indianapolis, Ind., has elected the following officers: President, J. McLain; vice president, J. Merz; secretary, J. Carr; treasurer, D. Baumann; captain, R. Hoffstatter.

Members of the Muncie Motorcycle Club, Muncie, Ind., have been enjoying a game of motorcycle hare and hounds during the past summer. The game is said to have originated with the St. Louis club last spring.

#### JOIN THE F. A. M.

which is the National Organization fostering the interests of motorcyclists along legislative and other lines. Cut this out, mail it, and you will get the reasons.

#### E. M. ESTABROOK

Chairman Membership Committee Federation  
American Motorcyclists,  
BANGOR, MAINE.

Please send me the F. A. M. Booklet and all information interesting to prospective members.

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# NEWS OF THE MANUFACTURER AND DEALER.

The following concerns have been incorporated recently to manufacture or deal in motor vehicles, accessories, etc.:

**Etna Motor Truck Company**, Detroit; \$400,000; to produce 1.5-ton worm driven wagons; J. George Wagner and others.

**Oshkosh Pneumatic Hub Company**, Oshkosh, Wis.; \$20,000; to produce pneumatic hubs for motor vehicle wheels; Fred E. Zeuhlke, Frank Doemel, Joseph Laus, Jr.

**Boston Prest-O-Seal Company**, Boston, Mass.; \$26,000; W. G. Tood, M. T. Hubbard.

**Parish-Ferrell Manufacturing Company**, Harrisburg, Penn.; \$50,000.

**Bridgeport Body Company**, Bridgeport, Conn.; \$50,000; to manufacture motor car bodies; A. W. Terry, A. W. Seward, J. W. Horton.

**Manufacturers' Sales Agency**, Bridgeport, Conn.; \$25,000; M. V. Doud, F. K. Doud, William L. Scott.

**Falcon Company**, Cleveland, O.; \$15,000; J. H. Cassidy, D. C. Meek, M. A. Copland, C. Verbsky, W. S. Mitchell.

**Isham Garage Company**, Coffeyville, Kan.; \$5,000; E. H. H. George, N. O. Upham, S. H. Hess, C. D. Welch, G. Buylless.

**McGraw Tire & Rubber Company**, East Palestine, O.; \$1,000,000.

**McClintock Engine Company**, Detroit; \$200,000; Dela-

**Bavler Lubricating System**, New York City; \$10,000; to manufacture lubricating systems; E. Well, G. H. Duck, C. S. Bavler.

**Auto Pedal Pad Company**, New York City; \$10,000; to manufacture pedal pads; H. Reich, E. M. Lichter, G. T. Young.

## WITH THE MANUFACTURERS.

**Owen McCusker** has been appointed manager of the Locomobile factory branch in Seattle, Wash.

**F. J. Urban**, sales manager of the Remy Electric Company, Anderson, Ind., has removed his headquarters to Chicago.

**A. R. Dawson** has been appointed factory sales agent for the Lozier Motor Company, Detroit, his territory including Nevada, Arizona, California and western Oregon.

**I. F. Scheeler**, South American representative of the Hudson Motor Car Company, Detroit, has been spending some time in this country, making his headquarters at the Hudson branch in New York City.

**J. M. Studebaker**, who is over 80 years of age and who is regarded as the dean of automobile manufacturers because of this fact, is an ardent motorist and drives his own car between his residence, Sunnyside, and his office in the works of the Studebaker Corporation at South Bend, Ind. The accompanying illustration shows him at the wheel of a Studebaker Six, which he regards as by far the best piece of work yet done by the designer, James Heaslet.

**Henry C. Miller**, Pacific Coast manager for the B. F. Goodrich Company, Akron, O., was married recently to Miss Gertrude Youngblood of Detroit.

**F. B. Ludwig** has resigned as sales and advertising manager of the Edwards Motor Car Company, New York City, to become southern district manager for the Vellie Motor Vehicle Company, with branch headquarters at 453 Peachtree avenue, Atlanta, Ga.

**W. H. Ellenbeck**, formerly special representative of the United States Tire Company in Philadelphia, has been appointed manager of the branch in Worcester, Mass., succeeding L. E. Hevaner, resigned.

**The Jones Speedometer Company** has removed its executive offices from New York to New Rochelle, the location of the main factory. The Bush Terminal plant in Brooklyn will be maintained and operated as heretofore.

**The Bremen-Wilson Manufacturing Company**, recently incorporated in Benton Harbor, Mich., with a capital of \$150,000, for the manufacture of starters and other accessories, has plans for two buildings, 60 by 100 and 25 by 60 feet.

**The Goodrich Rubber Company**, Toronto, Ont., has purchased a large tract of land from the Ontario Power Company and will erect a factory or group of factory buildings in which some 1800 men will be employed in the production of Goodrich tires for the Canadian trade.

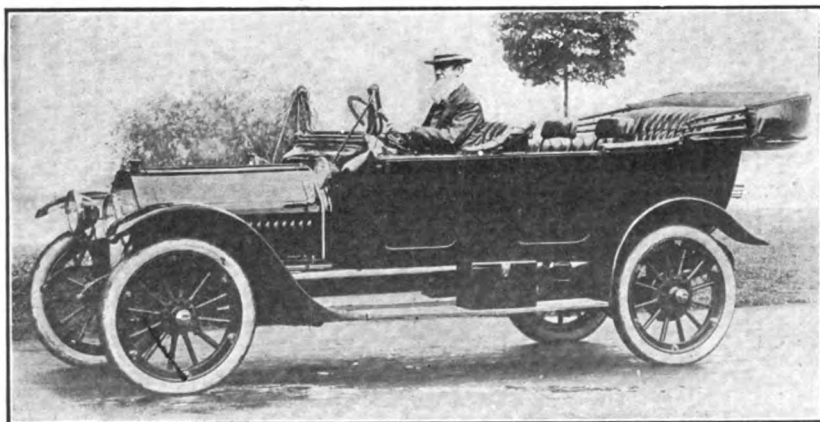
**The Uhrlandt Gas Generator Company**, recently incorporated in Columbus, O., with capital of \$50,000, for the production of gas generators, has established offices at 82 West Broad street, and has opened a factory at Linn and Ludlow streets.

**The Empire Automobile Company**, Indianapolis, Ind., has removed its executive offices from 238 Massachusetts avenue to 528 North Capitol avenue.

**The Welding Company**, Springfield, Mass., with branches in Boston, Holyoke, Hartford and Bridgeport, has opened another branch at 281 Bridge street, Salem, Mass.

**The La Bell Funeral Motor Car Company** has been organized in Detroit to place in the market the La Bell funeral car, having compartment for casket, flowers, mourners and pall bearers. The body is subject to a patent recently issued to A. La Bell.

**The General Motors Company**, Detroit, has again an-



**J. M. Studebaker, Octogenarian Automobile Manufacturer, Enjoying a Drive in His Studebaker Six.**

ware corporation; to manufacture combustion engines; Francis C. Osborn, G. Edgar Allen, Charles D. McClintock.

**Capital City Taxicab Company**, Edmonton, Alta.; \$100,000.

**Falconer Iron Works**, Falconer, N. Y.; \$15,000; repair shop and garage; G. L. Gilbert, J. C. Wright, J. S. Wright.

**Chandler Motor Car Company**, Fort Worth, Tex.; \$5,000; B. K. Smith, M. H. Smith, R. E. Southern.

**Rapid Heater Company**, Grand Rapids, Mich.; \$8,000; to deal in motor cars; A. Harris, J. S. McDowell.

**Town Herman Auto Transit Company**, Herman, Wis.; \$8,000; W. Grosshuesch, A. Frome, Jr., W. F. Buscher.

**Monarch Auto Company**, Louisville, Ky.; \$10,000; to sell automobiles; C. H. Pierson, J. Gosnell, G. W. Aydelott, A. T. Wingate, C. A. Colley, J. L. Morris.

**Kentucky Kissel Car Sales Company**, Lexington, Ky.; S. H. Halley, O. R. Hukle, P. M. Justice.

**Auto Distributors Company**, Logansport, Ind.; \$10,000; F. C. King, O. H. Binns, A. E. Binns.

**Canadian Drednot Motor Trucks, Ltd.**, Montreal, Que.; \$125,000; W. L. Haskell, J. S. Bigby.

**Crown Motor Car & Foundries, Ltd.**, Montreal, Que.; \$100,000.

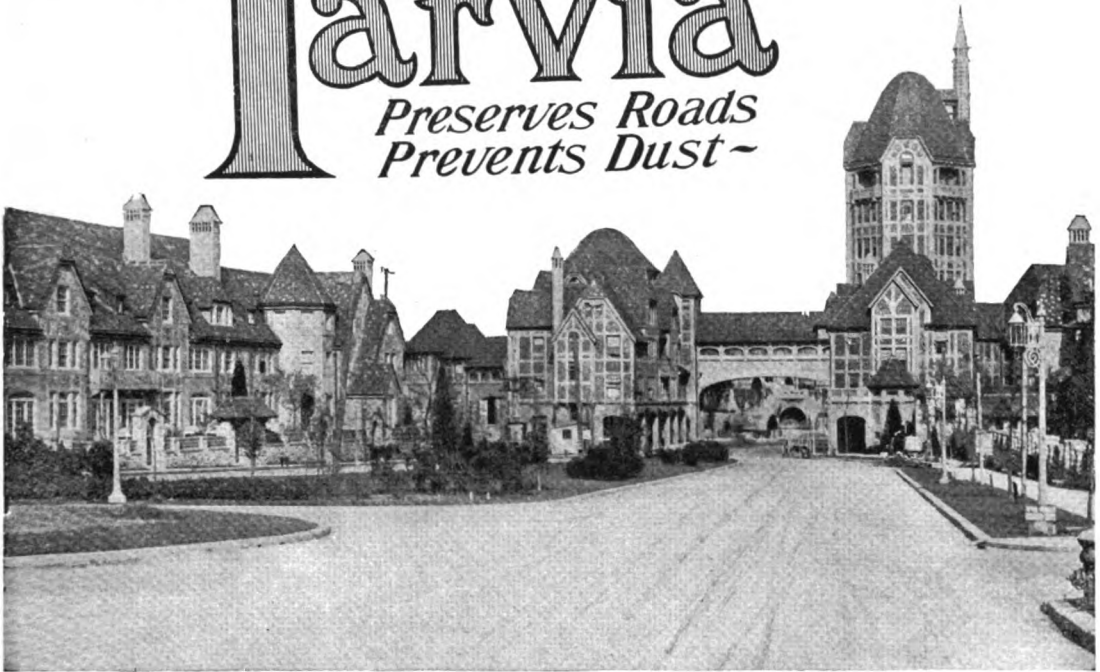
**Velvet Company**, New York City; \$5,000; to manufacture motors; W. D. Ramsburgh, H. C. Proctor, A. H. Miller.

**New Era Tire Treatment Company**, Regina, Sask.; \$20,000.



# Tarvia

*Preserves Roads  
Prevents Dust~*



Sage Foundation Homes Co., Forest Hills, L. I. Constructed with "Tarvia X" 1910. Treated with "Tarvia B" 1913.

## Dust is Expensive

WHEN an automobile speeds down an ordinary macadam road it leaves in its wake a cloud of dust which is carried by the winds over the neighboring fields, houses and lawns.

This is just as surely a waste of good material as if the automobilist dug material out of the highway and carted it away. Dust represents waste—costly waste—and the taxpayers feel the result. A road that is properly built for modern traffic will not be dusty.

Plain macadam gives way under the wear and tear of heavy rubber-tired automobile wheels and the surface binder of the road is

torn away in the form of dust, until in time the coarse stone itself is exposed and a costly renewal of the road is necessary.

Modern roads should be built to resist modern traffic. To build any other kind is wasteful. A better binder than the ordinary mineral binder is needed and is offered in Tarvia, a coal tar compound especially prepared for use on roads.

Tarvia is dense, viscid, waterproof. It fills the interstices between the stone and forms a tough, plastic matrix. This makes a waterproof and automobile-proof surface. The maintenance cost is usually so low as to more than balance the cost of Tarvia treatment.

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anticipated payment on its notes, making a payment of \$1,000,000 to the Central Trust Company of that city in August on notes due Oct. 1.

**The Motor & Manufacturing Company**, Lux Light building, Buffalo, N. Y., has purchased property in that city and will erect a new factory.

**The Peters Machine & Manufacturing Company**, Whitney Power building, Cleveland, O., maker of automobile parts, will erect a new factory on West Madison avenue and purchase \$35,000 worth of new machinery.

**The Bosch Magneto Company**, New York City, is building a casino and restaurant opposite its factory on North Main street, Springfield, Mass., at a cost of \$18,000.

**The Motor Casting Company**, Pontiac, Mich., is enlarging its present plant.

**The Packard Motor Car Company**, Detroit, has declared its regular quarterly dividend of 1.75 per cent. on preferred stock, payable Sept. 15.

**The Standard Automobile Company**, Moose Jaw, Sask., is a new concern in the Canadian industry, and will produce cars fitted with wire wheels.

**The Milwaukee Auto Specialty Company**, Milwaukee, Wis., maker of accessories, has opened a garage and service station at Chestnut and Seventh streets, adjoining its factory. Walter R. Fleischer is in charge as manager.

**The Electric Auto-Light Company**, Toledo, O., maker of starting, lighting and ignition systems, has by the erection of the building shown by the accompanying illustration, increased the floor space of its plant more than 25,000 square feet. More than 100 additional workmen



**The New Factory of the Electric Auto-Light Company at Toledo, O., Which Has Greatly Increased the Production of That Concern.**

have been employed. The building has been equipped with high-grade automatic machinery. The company now has a capacity of 100 complete systems a day, but it is believed that it will be necessary to still further increase the production departments before the end of the year.

**The El Starr Manufacturing Company**, Milwaukee, Wis., has leased the Wilson building, 223-229 Erie street, Chicago, and is planning to remove its factory to that city.

#### GARAGE AND DEALER.

**Edgar Walker** has opened a showroom for Gaulois tires at 127 Bay street, Toronto, Ont.

**John Hall, Jr.**, has purchased the interest of his partner, William Mitchell, in the body painting business conducted by them in Springfield, Mass.

**G. & E. Tisch**, Grand Rapids, Mich., has been appointed distributor for Federal tires in western Michigan.

**The Velle-Paige Motor Car Company**, Cleveland, O., has changed its name to the Velle Motor Car Company, and will handle the Velle line only in the future.

**The Bunting-Stone Hardware Company**, Kansas City, Mo., will open a motor car accessory department in connection with its hardware business in the near future.

**Milton A. Kent** has sold his interests in the Rambler Sales Room, 366 Park avenue, Kenosha, Wis., to Charles

E. Turnock, who will handle the Rambler line in Kenosha county and the eastern half of Racine county.

**The F. B. Stearns Company**, Cleveland, O., has opened a new factory branch at 742 South Olive street, Los Angeles, Cal. J. H. Duffee is in charge as manager.

**The Twyman Motor Car Company**, Studebaker distributor, has opened a new retail establishment in Columbus, O. The company has a wholesale store in that city and maintains retail branches in Dayton and Cincinnati, supplying nearly 100 dealers. O. W. Lawson is manager of the new store.

**The Garland Automobile Company**, Pepperell square, Saco, Me., has been reorganized, the new firm comprising William A. Gilman and Ira Garland.

**The Day & Night Garage** has been established at 316-318 Avenue C, Miami, Fla., under the management of E. W. Palmquist and A. M. Campbell.

**The S. W. Crawford Auto Company**, De Soto, Mo., agent for Ford cars, has opened a garage and repair shop on Easton street.

**J. D. Perry Lewis**, St. Louis, Mo., has taken over the city and state agency for Marion cars and secured salesrooms at Walton and Washington avenues.

**The Abbott Motor Car Company**, Detroit, factory branch of the Abbott Motor Company of that city, has placed its business in the hands of the Gaston-Richardson Company, a new firm, composed of George T. Gaston and Douglas C. Richardson. The present quarters at Jefferson avenue and Brush street will be retained.

**Ray Alberts** has purchased a half-interest in the garage owned by H. J. Hornung, on Fifth street, Eureka, Cal.

**The Fred M. Smith Company**, Hibbing, Mich., has changed its name to the Advance Auto Company. G. N. Buchart is president.

**The D. C. Tiffany Company**, Boston, which has operated an exclusively electric garage, has become an agency, taking on the Ohio electric line.

**Curtis Dawson** has purchased his partner's interest in the Tiskilwa Auto Company, Tiskilwa, Ill., and will continue the business alone.

**The National Garage Company**, 508 14th street, Washington, D. C., has taken over the business heretofore conducted by Collins, Gru & Meagher.

**The Acme Top & Trimming Company**, 1333 14th street, Washington, D. C., has been formed by R. L. Hooven and Frank Hann, to deal in and repair automobile tops and trimmings.

**The Hudson Automobile Company**, a new Hudson agent in Washington, D. C., has located at 1136 Connecticut avenue. Howard G. Kneessi is manager.

**Henry L. Hornberger**, formerly manager of the Oakland branch in San Francisco, has formed the Henry L. Hornberger Company, to handle the distribution of Palmer-Singer cars in California, Oregon, Washington and Idaho.

**The Doxameter Sales Company** has been organized by L. E. Carpenter and A. W. Clark at 510 Temple court, Minneapolis, Minn., to handle the Doxameter.

**The Wetmore-Quinn Company**, Detroit, which recently purchased the Paige agency from the William J. Marshall Auto Company, has added the Lozier to its line. Mr. Wetmore formerly was assistant sales manager of the Lozier Motor Company.

**Clarence Campbell**, Strawberry Point, Ia., has opened a garage and is negotiating for the agency for a medium priced car.

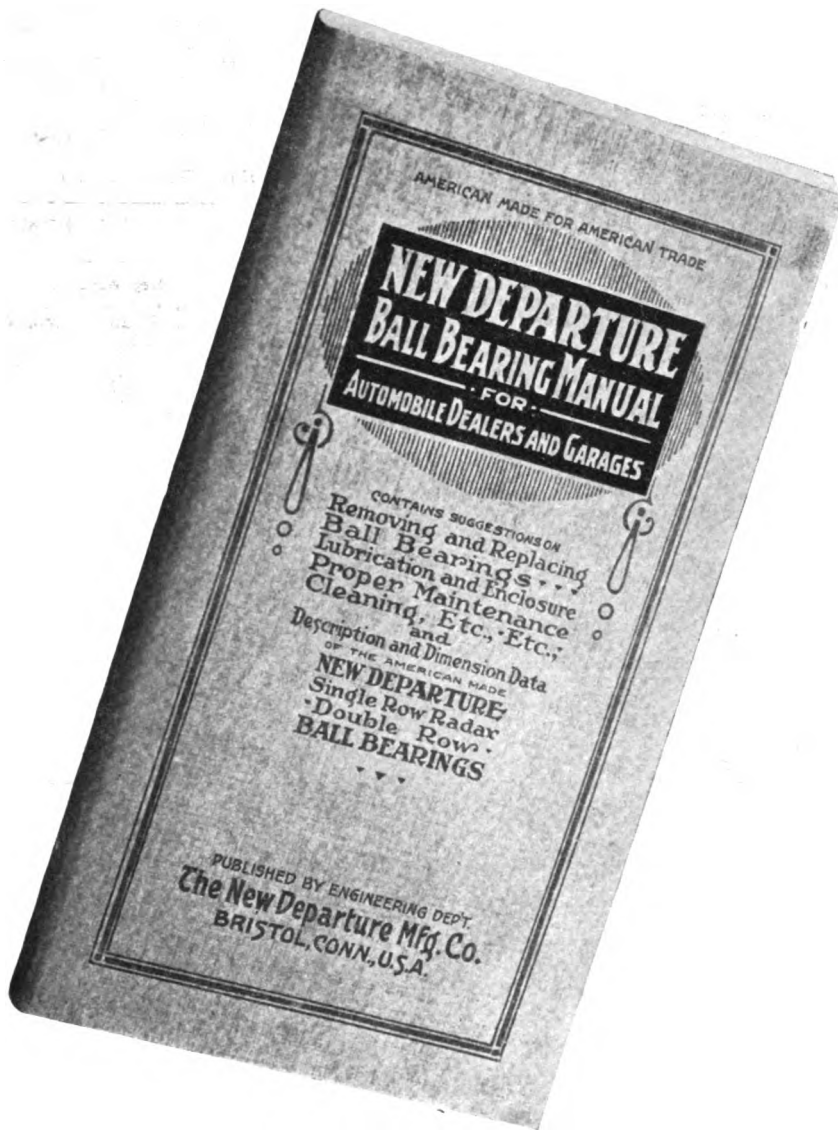
**Otto Haug & Son**, which recently removed from Great Bend, Kan., to Manchester, Ia., is enlarging its repair shop and garage.

**The Hearsey-Willis Company**, Indianapolis, Ind., distributor for Hupmobile cars, has removed to 339 North Capitol avenue.

**The Hunter Automobile Company**, Watertown, S. D., will remove from the Harper building to a new location where it will handle the Ford and Cadillac lines.

**The Balline Auto Company**, Watertown, S. D., will occupy the garage in the Walker building vacated by the Hunter Automobile Company, where it will handle Chalmers and Overland cars. The company also maintains a garage in Redfield, S. D.





## TO DEALERS AND GARAGE MEN

THIS BOOK IS PARTICULARLY FOR YOU—

Full of practical suggestions on the proper methods of removing and replacing ball bearings, cleansing, lubricating, enclosure, maintenance, etc., etc., prepared by our engineers. It is a real manual and is worth real money to you. We will send it free if you address your request to

DEPARTMENT D

**THE NEW DEPARTURE MANUFACTURING COMPANY**  
BRISTOL, CONNECTICUT

Western Branch, 1016-17 Ford Building, Detroit, Michigan

When Writing to Advertisers, Please Mention The Automobile Journal.



## RECENT PATENTS.

**Anti-Skidding Device**, Charles W. Cramer, Scranton, Penn. No. 1,071,031. Filed Sept. 7, 1911.

**Vehicle Wheel**, Charles W. Cramer, Scranton, Penn. No. 1,071,032. Filed Sept. 21, 1911.

**Primer for Gas Engines**, George F. Fischer, Newark, N. J. No. 1,071,038. Filed Jan. 10, 1913.

**Gas Engine Starter**, Stephen S. Krayner, St. Louis, Mo. No. 1,071,059. Filed June 28, 1912.

**Tire Tube Tester**, Horace E. Whitney, Cambridge, Mass., assignor to the Dover Stamping & Manufacturing Co. No. 1,071,124. Filed May 17, 1911.

**Internal Combustion Engine**, John Haug, Berkeley, Cal. No. 1,071,156. Filed Dec. 21, 1911.

**Safety Appliance Lock**, Jacob H. Mertz and Elmer Schatz, said Mertz assignor to said Schatz. No. 1,071,169. Filed March 11, 1912.

**Gas Engine Governor**, Charles White, Baltimore, Md. No. 1,071,193. Filed Nov. 27, 1912.

**Demountable Tire Rim**, Martin H. Collom, Denver, Col., assignor to the Collom Demountable Rim Manufacturing Co. of the same city. No. 1,071,206. Filed April 29, 1912.

**Motorcycle Seat and Support**, John L. Miller, Paulsboro, N. J. No. 1,071,255. Filed Dec. 4, 1912.

**Internal Combustion Engine Starter**, Thomas E. Plater and Edward B. Rees, Monett, Mo. No. 1,071,260. Filed Nov. 11, 1909.

**Tilting Auto Truck**, Gustav Schlatter, Arbon, Switzerland. No. 1,071,265. Filed Sept. 19, 1912.

**Strainer**, William H. Finigan, Sharon Hill, Penn., assignor to the Gilbert & Barker Manufacturing Co., New York City. No. 1,071,306. Filed Oct. 15, 1910.

**Match Starter for Internal Combustion Engine**, Marvin Marsden, Edgerton, Wis., assignor of one-half to E. M. Ladd of the same place. No. 1,071,327. Filed April 28, 1911.

**Vehicle Frame**, Charles J. Pembroke, Rochester, N. Y. No. 1,071,335. Filed April 5, 1905.

**Tire Saver**, Le Roy Wilbourn, Ashland, O., assignor to the Ashland Manufacturing Co. of the same place. No. 1,071,378. Filed Jan. 6, 1913.

**Non-Skidding Device**, Harry J. Hernshiem, Pleasant Prairie, Wis. No. 1,071,418. Filed Oct. 8, 1912.

**Engine Starter**, Alvan O. Levick and William H. Hussey. No. 1,071,444. Filed Jan. 20, 1911.

**Vehicle Chassis**, Sheridan Babcock, Iowa Falls, Ia. No. 1,071,498. Filed March 13, 1912.

**Shock Absorber**, Towson Hand, Orlando, Fla. No. 1,071,518. Filed June 3, 1913.

**Automobile Signal**, Harold M. MacCausland, Worcester, Mass. No. 1,071,525. Filed March 8, 1912.

**Muffler**, Nathaniel Rapp, assignor to the Commercial Trust Company of the same city. No. 1,071,528. Filed Oct. 28, 1912.

**Identifying Means Device**, Oscar A. Weissenborn, Jersey City, N. J. No. 1,071,540. Filed Dec. 27, 1912.

**Support for Spare Wheels**, Charles Grant Hilton and George Tom Hilton, Loughborough, England, assignors to the Rotax Motor & Cycle Co., London, England. No. 1,071,553. Filed Nov. 11, 1909.

**Searchlight Reflector**, Charles Algernon Parsons and George Gerald Stoney, New-Castle-upon-Tyne, England, said Stoney assignor to said Parsons. No. 1,071,569. Filed June 13, 1910.

**Puncture Repair Plug**, Clyde R. Tyrrell, Montesano, Wash., assignor to the Terrell Manufacturing Company of the same place. No. 1,071,595. Filed May 17, 1912.

**Lubricating System**, Harvey F. Maranville, Akron, O., assignor to the Perfection Spring Company, Cleveland, O. No. 1,071,623. Filed Feb. 24, 1910.

**Packing Ring**, Louis E. McQuay, Webster Groves, Mo., and William K. Norris, East St. Louis, Ill. No. 1,071,647. Filed May 1, 1913.

**Tire Protector**, Julius Brotschneider, San Francisco, Cal. No. 1,071,695. Filed June 5, 1913.

**Tire Armor**, George Edward Hanson, Atlanta, Ga. No. 1,071,741. Filed Nov. 6, 1912.

**Automobile Lock**, Philip Kovsky and John F. Hicks, Philadelphia, Penn. No. 1,071,756. Filed May 3, 1913.

**Motor Starting Mechanism**, Hubert Meredith-Jones, New York City, assignor to the Columbia Nut & Bolt Co. of the same city. No. 1,071,775. Filed June 24, 1912.

**Automobile Lamp**, Oscar O'Neal, Fremont, Mich. No. 1,071,783. Filed Nov. 8, 1912.

**Number Display Device**, Elgin Stoddard, San Francisco, Cal. No. 1,071,821. Filed June 5, 1912.

**Explosive Engine**, Elmer E. Sutphin, Davenport, Ia. No. 1,071,823. Filed July 26, 1912.

**Carburetor**, Frank H. and Frederick O. Ball, Plainfield, N. J. No. 1,071,858. Filed Jan. 11, 1912.

**Tire Pressure Indicator & Signal**, Charles C. Cleveland, Boulder, Col. No. 1,071,880. Filed April 6, 1912.

**Lamp Structure**, Charles E. Godley, Detroit, assignor to the Edmund & Jones Manufacturing Co. of the same city. No. 1,071,907. Filed Sept. 1, 1911.

## COMING EVENTS.

## September.

Sept. 12—Track races, Canfield, O.  
 Sept. 12—Track races, Youngstown, O.  
 Sept. 13—Track races, Toledo, O.  
 Sept. 13—Track races, Covington, Ky.  
 Sept. 13—Track races, Grand Rapids, Mich.  
 Sept. 14—Track races, Seattle, Wash.  
 Sept. 18—Hill climb, Asheville, N. C.  
 Sept. 20-21—Track races, Detroit, Mich.  
 Sept. 21—Light car race, Boulogne, France.  
 Sept. 26-27—Track races, Peoria, Ill.  
 Sept. 26-29—Convention, State Firemen's Association, New Bedford, Mass.  
 Sept. 27—Track races, White Plains, N. Y.  
 Sept. 27—Track races, San Marcos, Tex.  
 Sept. 27-28—Track races, Bakersfield, Cal.  
 Sept. 28—Hill climb, Mont Verdun, France.  
 Sept. 29-Oct. 4—American Road Congress, Detroit, Mich.

## October.

Oct. 3—Track races, Trenton, N. J.  
 Oct. 3-4—Track races, Oklahoma City, Okla.  
 Oct. 4-11—Around Lake Michigan tour, Chicago, Ill.  
 Oct. 6-18—Show, St. Louis, Mo.  
 Oct. 11—Track races, Springfield, Ill.  
 Oct. 12-17—Convention, American Institute of Metals, Chicago, Ill.  
 Oct. 12-17—Convention, Carriage Builders' National Association, St. Louis, Mo.  
 Oct. 13-18—National fire prevention conference, Philadelphia, Penn.  
 Oct. 15-25—Electrical Show, Grand Central Palace, New York.  
 Oct. 17-27—Automobile Salon, Grand Palais, France.  
 Oct. 18-19—Track races, St. Louis, Mo.  
 Oct. 24—Convention, American Iron & Steel Institute, Chicago, Ill.  
 Oct. 27-28—Convention, Electric Vehicle Association of America, Chicago, Ill.

## November.

Nov. 2-3—Road race, El Paso, Tex.-Phoenix, Ariz.  
 Nov. 4-5—Road race, Los Angeles, Cal.-Phoenix, Ariz.  
 Nov. 4-5—Road race, San Diego, Cal.-Phoenix, Ariz.  
 Nov. 6—Track races, Phoenix, Ariz.  
 Nov. 8-12—Track races, Shreveport, La.  
 Nov. 7-15—Olympia Show, London, England.  
 Nov. 8-15—Show, Atlanta, Ga.  
 Nov. 24—Vanderbilt Cup race, Savannah, Ga.  
 Nov. 27—Grand Prize race, Savannah, Ga.

## December.

Dec. 9-12—Convention, American Road Builders' Association, Philadelphia, Penn.  
 Dec. 10-12—Convention, Retail Implement & Vehicle Dealers' Association, Milwaukee, Wis.  
 Dec. 11-20—International exposition of safety and sanitation, American Museum of Safety, New York City.

## January.

Jan. 3-10—Pleasure car show, Grand Central Palace, New York City.  
 Jan. 24-31—Pleasure car show, Coliseum, Chicago, Ill.  
 Jan. 26-31—Show, Scranton, Penn.  
 Jan. 31-Feb. 7—Show, Minneapolis, Minn.

## February.

Feb. 2-7—Pleasure car show, Buffalo, N. Y.  
 Feb. 9-14—Truck show, Buffalo, N. Y.  
 Feb. 22-March 5—Show, Cincinnati, O.  
 Feb. 24-28—Show, First Regiment Armory, Newark, N. J.

## March.

March 7-14—Pleasure car show, Mechanics' Building, Boston, Mass.  
 March 17-21—Truck show, Mechanics' Building, Boston, Mass.



## RECENTLY ANNOUNCED 1914 MODELS.

**A**SIDE from the 1914 models described in more detail elsewhere in this issue, several others have made their appearance during the past two weeks. It will be noted that the list of cyclecars is being increased very rapidly. Only the more important features and changes are considered in the following brief statements concerning the new models:

**Moon**—Moon Motor Car Company, St. Louis, Mo. Model 42. Changes include: Motor driven tire pump. Force feed fuel system with tank at the rear of the car. Compartment in the cowl dash for smaller tools.

**Moline**—Moline Automobile Company, East Moline, Ill. Series M-40. Continues line previously announced with the exception of a new Weston-Mott full floating rear axle. New type of touring body.

**Los Angeles Cyclecar**—Los Angeles Cycle Car Company, Los Angeles, Cal. Motor, four-cylinder, T head, 2.5-inch bore, 3.5-inch stroke, rated at 12-15 horsepower. Friction transmission. Double chain drive. No differential. Wheelbase, 102 inches; tread, 44; weight, 500 pounds. Tires, 28 by 2.75 inches. Wire wheels. Two passengers, side by side. Speed about 60 miles an hour.

**Chalmers**—Chalmers Motor Company, Detroit. Model 24. Motor, six-cylinder, T head, en bloc, all mechanism enclosed, four-inch bore, 5.5-inch stroke. Clutch, multiple disc. Transmission, four speeds forward and reverse. Left hand drive, centre control. Six body types, streamline design, tapered bonnet, side lamps eliminated, clean running boards.

**Pathfinder**—Motor Manufacturing Company, Indianapolis, Ind. Five-passenger touring, two-passenger roadster, two-passenger cruiser and Martha Washington coach. Practically the same as previous models. Motor is the same except for lighter pistons and connecting rods, said to result in about 20 per cent. increase in power capacity. Some minor improvements in body design and equipment.

**Stearns**—F. B. Stearns Company, Cleveland, O. Coupe and sedan added to former line, fitted to either four or six-cylinder chassis. Knight motor continued. Six remains practically the same, while transmission in the four is moved from rear axle to amidships location. All models fitted with sloping hood, following so-called foreign practise; left hand drive, centre control and wire wheels, the last named being optional.

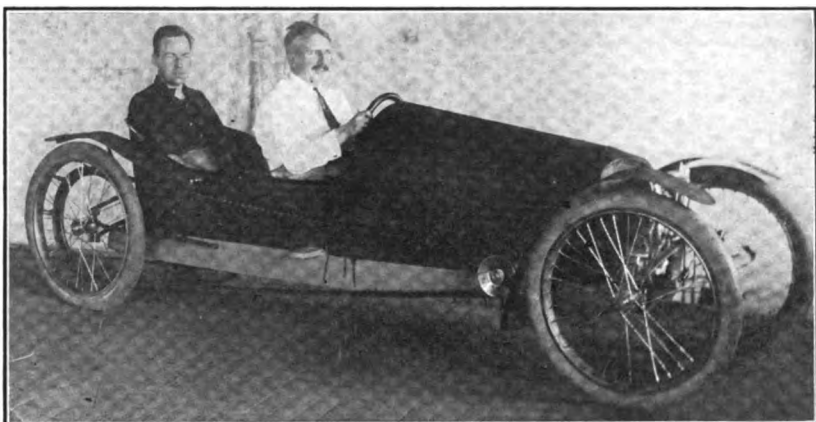
**Reo**—Reo Motor Car Company, Lansing, Mich. Reo the Fifth, fall series. Touring car and roadster, now equipped with electric starter, lights and horn, speedometer, mohair top, curtains, envelope, extra demountable rim, etc. Body is of new design. Instrument board and all instruments set flush. Electric searchlights have dimming arrangement. New design ventilating windshield. New style tire carrier holds rear light and number plate. Transmission has been changed with a view to silence and maximum efficiency. Wheels are 34 inches diameter with demountable rims; tires, 24 by four inches front and rear. Both brakes operated by pedal. Price reduced \$220.

**American**—American Motors Company, Indianapolis, Ind. Type 646, six-cylinder, six-passenger touring car. In many respects the chassis is identical with type 644, the principal changes being the lengthening of the wheelbase to 140 inches, a motor of 4.25-inch bore and 5.5-inch

stroke, and a new and improved electric equipment, the last named comprising two distinct units, both mounted in one housing. Cylinders are cast en bloc, but with separate exhaust ports for each, the manifold being bolted and easily removed. Body is a streamline design, with high flush sides and deep seats.

**Wahl**—Wahl Motor Company, Detroit. Two-passenger roadster and five-passenger touring car; one chassis. Motor, clutch and transmission in a unit. Four-cylinder, cast in pairs, 3.25-inch bore, 5.5-inch stroke. Constant level splash lubrication, pump circulation. Thermosiphon cooling. Bosch magneto. Holley carburetor. Multiple disc clutch, Raybestos lined. Three forward speeds and reverse. Salisbury semi-floating rear axle. Semi-elliptic springs front, full elliptic rear. Tires, 32 by 3.5 inches. Right hand drive, centre control. Equipment includes Prest-O-Lite tank, gas headlights, oil side and tail lamps, speedometer, windshield, mohair top, top envelope, etc.

**Imp Cyclecar**—Imp Cycle Car Company, Auburn, Ind. Motor, two-cylinder, vertical, 10 horsepower at 1500 revolutions, 15 at 2500, mechanically operated inlet valves, air-cooled, piston pump circulation for oil, high-tension magneto. Friction transmission. Drive by 1.125-inch V belt. No differential. Two transverse springs are mount-



Imp Cyclecar, an Entirely New Design from Auburn, Ind.

ed on underslung body at each end. Braking accomplished by a hard wood V block, attached on lever on radius rods and controlled by pedal, pressed into rear pulley grooves. Hand wheel for steering. Wire wheels, with 28 by 2.5-inch standard clincher tires. Wheelbase 100 inches, tread 36. Weight 450 pounds. Speed 50 miles an hour, maximum.

**Case**—J. I. Case Threshing Machine Company, Racine, Wis. Models 25, 35 and 40, all four-cylinder. Model 40 continued from last season, with improvements, including: Bosch two-point ignition, new type of Rayfield carburetor, heavier rear axle shafts and new cowl board. Model 25 has unit power plant, T head engine, 3.75-inch bore, 4.75-inch stroke. Plunger pump lubrication with auxiliary splash. Cooling by centrifugal pump. Bosch duplex ignition. Non-water jacketed Rayfield carburetor. Disc clutch. Three forward speeds and reverse. Weston-Mott three-quarter floating rear axle. Rear springs, platform type, with cross piece linked freely to semi-elliptic side members. Tires, 32 by four inches on quick detachable rims. Left hand drive, centre control. Model 35 differs principally as follows: Motor, 4.125-inch bore, 5.5-inch stroke. Gear pump lubrication. Bosch dual ignition. Water jacketed carburetor. Full floating rear axle. Three-quarter elliptic rear springs. Tires, 35 by 4.5 inches. All models equipped with Westinghouse electric lighting and starting system. Warner speedometer, eight-day clock, electric horn, extra tire on rim, two extra inner tubes, tire cover, Weed chains, top, windshield, spark plug pump and full set of lights.





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**One Pound Rolls  
A Convenient and Attractive  
Package of Cotton Waste for  
AUTOMOBILE AND  
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In rolls, opening on end, packed with 12 convenient handfulls, each one of which can be taken out without spoiling the rest of the package

**HANDY FOR THE TOOL-BOX  
FOR THE GARAGE  
FOR HOUSEHOLD USE**

ASK YOUR SUPPLY HOUSE FOR THESE GOODS  
**UNION WADDING COMPANY**  
**PAWTUCKET : RHODE ISLAND**

## REO THE FIFTH

Final and crowning achievement of R. E. Olds, pioneer designer of autos. A standard size 30 to 35 Horsepower four cylinder car of modern refinements priced at only \$1,095.

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**STARTS—LIGHTS—IGNITES**

Six Volt System Does It All.  
Write for our magneto exchange offer.

**REMY ELECTRIC COMPANY, Anderson, Ind.**

## TIRE PROBLEMS SOLVED

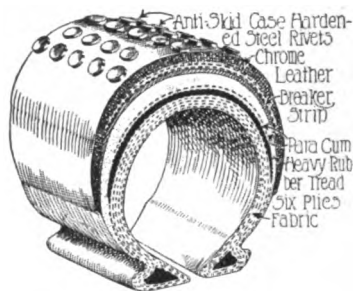
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## INVINCIBLE NON-SKID TIRES

**PUNCTURE AND BLOW-OUT PROOF**

**GUARANTEED FOR 3000 MILES**

By the INVINCIBLE process we rebuild completely your old, worn out casing, making it better than new. New Fabric and Rubber used throughout. The Chrome



Leather is solidly vulcanized to casing, eliminating heat or friction. The steel rivets endure during life of shoe, a feature found in no other tire. The cost is but four-fifths that of a plain tread shoe. We pay express charges both ways.

Write for our booklet on tire troubles and how the INVINCIBLE eliminates them. References furnished. We have hundreds of testimonials from users. Full value for your money as you deal direct with the maker.

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### Aplco Electric Lighting System

makes night riding safe and delightful. It is

"The right way to light the way."

Ask your dealer about it or write us.

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## Let Your Motor Do The Work

The Pump that took the "Shun" out of Inflation.

It's a pleasure to inflate your tires without sweating, fuming and straining.

It's an economy to get the exact pressure you need to make your tires give maximum service.

It's a convenience to attach and detach your pump without a wrench. A twist of the wrist and a few seconds of time to attach the pump, one to four minutes with your motor at low speed to get the right pressure. The gauge tells you when to stop.

**THE BROWN IMPULSE TIRE PUMP** for 1913 is the only tire pump that attaches and detaches without a wrench; the only one that includes hose, self-opening valve connection, high grade recording gauge and Quick Detachable Spark Plug as part of its regular equipment. Your 1913 equipment is not complete without it. It sells for \$15.00. Ask your dealer today. If he can't tell you all about it, send to us for descriptive literature.

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## Reduce Repair Bills

Regular and systematic use of an efficient lubricant will keep your car out of the repair shop. Colonial Oil furnishes the maximum of lubricating efficiency.

Use COLONIAL and  
NOTE the DIFFERENCE  
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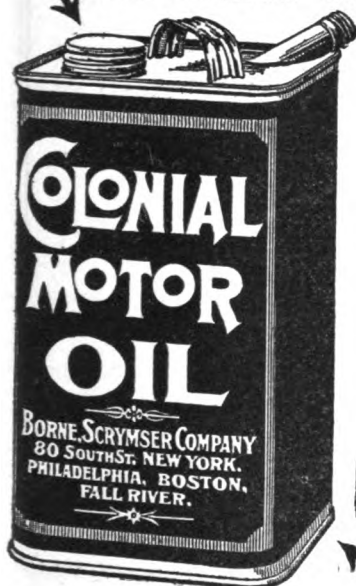
*A real transmission grease*  
Will make your gears run smoothly and quietly because it is made especially for gear lubrication.

COLONIAL  
Timing Gear Oil

overcomes all trouble with your timing gear. Use it and NOTE the DIFFERENCE.

SILEX GREASE  
*The greasiest grease made*

The real test of a grease is not its looks or the feeling but its lubricating properties. SILEX is made to lubricate and last.



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THE 10% OVERWEIGHT TIRES

Guaranteed for 4000 Miles Service

Measured by Mileage, the Cheapest Shoes Ever Made.  
Olincher and Quick Detachable, Plain and Break-Skid Treads, Regular and Metric Sizes, for All Standard Rims.

THE CATARACT RUBBER COMPANY

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Factory: WOOSTER, O.

"This makes a total distance to date of approximately 14,000 miles, distributed through a period of more than one year and two months without attention to batteries and yet running strong."—Report on 6 Burn-Bostons on 4-cyl. car, no other ignition (Atwater Kent Coil).

If your dealer hasn't them send us his name and we'll see that you are supplied  
**BURN-BOSTON BATTERY,** 19 Doane St.  
BOSTON, MASS.

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## HERZ PLUG



Eventually you will disregard the cheap hardware commonly called "Spark Plugs," and use the HERZ PLUG—the only Plug that is or can be

**Guaranteed  
a Year**

The usual Spark Plug troubles are unknown to users of the HERZ PLUG. Once installed, it never is taken out.

**Double Blue Enamel Stone**

No Sooting—No Cleaning—No Porcelain—No Breakage.

**No Experiment:  
In its 20th Year**

Price \$1.50 postpaid. Ask your dealer, or write us.

We also make the  
**HERZ MAGNETO**

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295 Lafayette St. New York.

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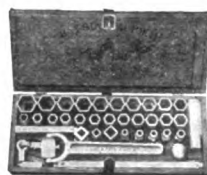
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Bay State Autokit, No. 1, \$10

Bay State Autokit, No. 2, \$7.50

Bay State Stickit, \$3

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## DECARBONIZER

Chemically removes carbon from cylinders, pistons, rings and valves

**INCREASES POWER 20 PER CENT.**

Volatilizes carbon, in which form it passes out thru exhaust; injury to metal impossible. Agents wanted in certain localities. Sample quart can \$1.50. Write today for particulars.

**MILWAUKEE AUTO SPECIALTY COMPANY**  
128 Second St., Milwaukee, Wis.





# The "Black Eagle" Spark Plug

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## 50 Cents Is Enough

The "Black Eagle" Spark Plug has made good because it was designed and manufactured with this result in view.

A person in close touch with the supply and manufacturing ends of the trade was a visitor at our factory recently, and was shown the details of construction, including the machinery, testing, and assembling of the "BLACK EAGLE" Spark Plug. What he said we believe will be of interest to you, as it indicates the effort on our part to supply a high grade plug at a reasonable price. We therefore quote below his impressions.

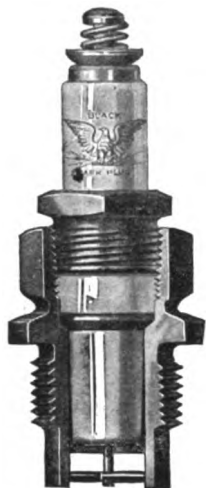
"I am simply amazed at the workmanship, material, and construction of the 'BLACK EAGLE' Spark Plug. When I saw this plug advertised at a price of 50c to the consumer, I naturally supposed it was a cheap, common, plug such as you occasionally find in jobbing houses on the bargain counter. I am convinced, after seeing these plugs tested, and examining minutely the machine parts which enter into their construction, that no better porcelain spark plug is offered by any one, regardless of the price they ask."

We are not influenced by what our competitors charge for spark plugs! We have ignored price precedent, for the reason that a high grade spark plug can be manufactured and sold at 50c each, and that is enough.

Sent prepaid on receipt of price. Made in all standard threads.

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### Torrington, Conn., U. S. A.



**"THE WELDING" COMPANY**  
 SPRINGFIELD BOSTON HARTFORD HOLYOKE  
 BRIDGEPORT SALEM  
 All Parts of Any Metal Welded and Guaranteed  
 ALUMINUM CASES AND CAST IRON CYLINDERS A SPECIALTY

*National*  
 STOCK CHAMPION  
 FIVE MODELS Electric Starter \$2750 to \$3400  
 Electric Lights  
 National Motor Vehicle Co., Indianapolis

**How Largest Profits Are Made**  
 We have some interesting facts in connection with increasing your car sales and profits.

Through merchandising strategy we have remedied these flaws. May we tell you about these things and about our kerosene-burning car, equipped with wire wheels, cowl dash, cowl fuel tank? Left drive, center seat control, the most salable car offered today. Write or wire for the facts.

Henderson Motor Car Co., Indianapolis, Ind.

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 Magneto  
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**MARBURG BROS., Inc.,**  
 Sole Importers  
 Detroit. 1790 Broadway, New York. Chicago.

**MIGHTY MICHIGAN "40"**  
 40-Horsepower Touring Car or Roadster, absolutely silent in operation. Oversize tires 35x4 1-2---cylinders 4 1-4x5 1-4 in.---118-in. wheel base---four-forward-speed transmission---dismountable rims---nickel mountings---massive, straight-line body---big, roomy seats---electric lighting by generator---everything. Price \$1585, includes full equipment. We also make a 33 H. P. model. Catalog on request.  
 (163) MICHIGAN MOTOR CAR CO., 185 Lay Blvd., Kalamazoo, Mich.

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**Weed Anti-Skid Chains**  
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## GOOD BRAKES

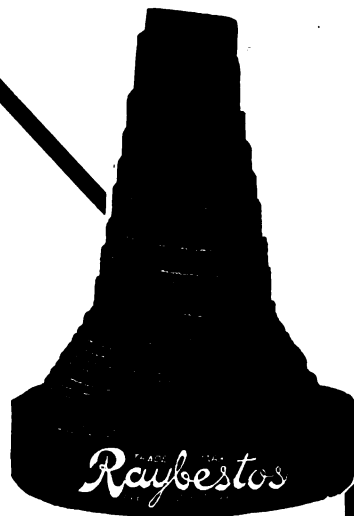
You Will Re-line Your Brakes With

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**Raybestos**  
REG. U.S. PAT. OFF.

"THE ORIGINAL AND BEST ASBESTOS BRAKE LINING"

It grips and holds. It compels your brakes to make good. Your repair man has a stock of RAYBESTOS on hand. He is anxious to put your brakes in shape—to re-line them with RAYBESTOS. Have him do it NOW. It will insure the SAFETY of your car.

RAYBESTOS is the Standard Brake Lining of the Industry. It is made of genuine long fibre asbestos specially woven and treated, and is practically indestructible. The name is stamped in every foot for your protection.



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*We also make Duplex and Raymond Brakes and Gyrex the Mixer.*



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Live wire dealers, write for unallotted territory.

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Electric self-cranking, electrically lighted.  
Four Forward Speeds.

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Car and Roadster - \$1850  
Model 30 Touring Car - \$1350  
Model 30 Roadster - \$1250

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Mechanically correct—easy to operate—perfect in material and workmanship. Used as standard equipment on the better cars.

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DON'T let rim rust destroy your tires;  
Paint them twice a season with

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Thoroughly expressive of the highest development of automobile design, materials and construction.

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\$5000 to \$6350

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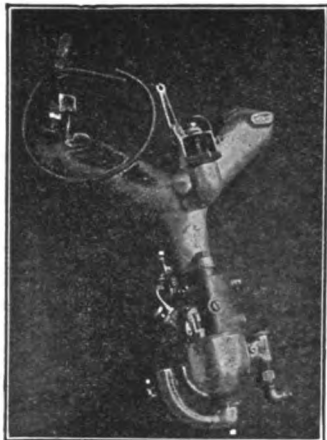
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Pat. America



Showing M&amp;M Attached with 1/4" Elbow.

## TRY THE M&M ECONOMIZER FOR SPEED, POWER AND ECONOMY

### HOW ABOUT THIS LETTER!

Moller Bros., Controller & Economizer Co., Lewistown, Pa.: Auburn, N. Y., August 14th, 1918.  
Gentlemen:—I am much pleased with the M&M Economizer that I put on my H&O touring car a few weeks ago. I am using a carburetor, which gives a very high mileage per gallon, but with the use of your Economizer I get several more miles per gallon, thereby making a marked saving in gasoline.

It also entirely eliminates the use of brakes, except on very steep grades, which saves much wear on brakes, and I believe is a saving on tires also. It takes a few days' practice to become familiar with the use of the Economizer, but any one will be well paid for their trouble in learning to use it. I would not part with mine for several times the price and cost of installing.

Yours very truly,

(Signed) F. LEE RODGERS.

WHAT COULD BE MORE CONVINCING THAN THE ABOVE LETTER! ALSO, the M&M is guaranteed to do just what we claim, and if it proves unsatisfactory within thirty days, YOUR MONEY WILL BE REFUNDED. (Reference—Citizens National Bank, Lewistown, Pa.)

The M&M is guaranteed to save from 40 to 50% of gasoline, and increase the speed and power 20% with less gasoline, and less carbon. It is the only known carburetor adjuster on the market, and RANKS FIRST AS A CARBON ELIMINATOR. For priming the motor, you cannot find its equal. PLEASE BEAR IN MIND—THERE IS NO SCREEN, or any other obstacle placed in the manifold, as this will have a tendency to CLOG THE MANIFOLD, and make it more difficult for the motor to absorb the gas and air.

Price of the M&M—\$3.50 and 17c extra for postage. We include either friction foot pedal, or steering post control, which consists of flexible shaft and wire. Requires 3/4" pipe tap. Elbow will be furnished upon request.

PRICE OF THE MOTORCYCLE SIZE—\$1.25 Prepaid. Size 1/4".

THE M&M ECONOMIZER IS "THE PATENTED ONE." Warning to users, makers and dealers, PATENT NO. 922,528—May 25, 1908.

WRITE US FOR FURTHER INFORMATION AND CATALOG.

**Moller Brothers Controller & Economizer Company, Dept. A**  
Main Office and Factory, Lewistown, Pa.

BOOKLET ON REQUEST

REPRESENTATIVES WANTED

## AUTOMOBILE TURNTABLES

THE T. C. BEACH CO.

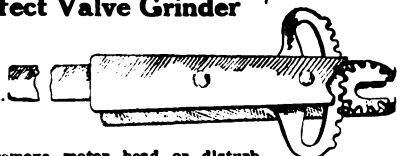
106 Ottawa Street.

St. Johns, Mich.

### WILL GRIND FORD VALVES

#### Wall's Perfect Valve Grinder

Patent Pending.  
Patents Allowed.



No need to remove motor head or disturb valve mechanism. A simple, practical tool, that works automatically and any one can operate it. Guaranteed, and will last for years. A new, simple and practical guide for owner, driver and repairer. Keep your valves in perfect condition. Cost of grinder saved first time used. For circulars and price list write

H. WALL, 290 Hope Street, BRISTOL, R. I.



### GEISZLER NON-SULPHATING STORAGE BATTERIES

Guaranteed perfect satisfaction or money refunded

SIZE 66 - \$20.00

GEISZLER BROS. STORAGE BATTERY COMPANY  
514 West 57th Street, New York City



### RUBY All-Steel Garages

An absolutely fireproof building, neat in appearance, with the strength of a skyscraper. Can be erected during your spare time. Small touring car size \$120. Other sizes in proportion. All of our buildings carry a fifteen year bank bond guarantee. Steel buildings for every purpose.

**KOLB SALES CO.**  
United States Rubber Bldg.  
NEW YORK

## DIXON'S No. 677

Graphite Grease is the Ideal Lubricant for Transmissions and Differentials. Write for the Book "Lubricating the Motor," No. 210.

**JOSEPH DIXON CRUCIBLE CO.**

Jersey City

(2)

New Jersey



### FOR YOUR AUTO OR GARAGE

Pyrene should be in every garage. Remember that Pyrene is the only effective extinguisher of gasoline fires.

Write for Booklet

**PYRENE COMPANY OF NEW ENGLAND**

176 Federal Street, Boston, Mass.

**EDWARDS  
FIREPROOF  
STEEL**

## GARAGES

For Automobiles and Motorcycles

**\$30 and Up**

Easy to put up. Portable. All sizes. Postal brings latest illustrated catalog.



**THE EDWARDS MFG. CO.,**  
414-484 Eggleston Ave.,  
Cincinnati, Ohio

Your tire troubles are over if your car is equipped with

### Dayton Airless Tires

Send for "Catechism"; shows you how motoring expense can be cut down and motoring pleasure increased.

Dayton Rubber Mfg. Co.,

1011 Kiser St., Dayton, Ohio

When Writing to Advertisers, Please Mention The Automobile Journal.



# Classified Buyers' Guide

## A Handy Reference for Purchasers

### ACCESSORY MANUFACTURERS AND JOBBERS.

**Auto Parts Co.**, Providence, R. I.  
**Hopewell Brothers**, Newton, Mass.  
 Branch: 1974 Broadway at 67th St., New York.  
**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.  
**Miller, Chas. E.**, 97-103 Reade St., New York.  
 Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 259 Peachtree St., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.  
**Milwaukee Auto Specialty Co.**, 128 Second St., Milwaukee, Wis.  
**Motor Parts Co.**, 185-187 Columbus ave., Boston; 818 No. Broad St., Philadelphia; Springfield, Mass.  
**Northwestern Chemical Co.**, Marietta, O.  
**Shaler Co.**, C. A., Waupun, Wis.  
**Waite Auto Supply Co.**, 81 Exchange place, Providence.

### ACETYLENE TANKS. (See Tanks.)

### ADJUSTERS.

**Vansickle, John A.**, Indianapolis. (Ford Ideal Ball and Socket Joint.)

### AIR COMPRESSORS AND TANKS.

**Williams Foundry & Machine Co.**, Akron, O.

### AMMETERS AND VOLTMETERS.

**Hoyt Electrical Instrument Works**, Penacook, N. H.

### AUTO LOCKS. (See Locks.)

### AUTOMOBILES. (See Cars.)

### AUTOMOBILE SPECIALTIES.

**Sumner, George, Inc.**, 1926 Broadway, New York.

### BALLS AND BALL BEARINGS.

**Boyd, F. Shirley**, 903 Boylston St., Boston. (R. I. V.)  
**Brets Co., J. S.**, 250 W. 54th St., New York. (F. & S.)  
**Marburg Bros., Inc.**, 1790 Broadway, New York. (S. R. O.)  
**New Departure Mfg. Co.**, Bristol, Conn.  
**R. I. V. Co.**, 1771 Broadway, New York. (R. I. V.)

### BATTERIES.

**Burn-Boston Battery Co.**, 19 Doane St., Boston.  
**Electric Storage Battery Co.**, Philadelphia. (Exide.)  
**Gelsner Bros. Storage Battery Co.**, 514 W. 57th St., New York.  
**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City. (J-M.)  
**Waite Auto Supply Co.**, 81 Exchange place, Providence. (Success.)  
**Willard Storage Battery Co.**, 5716 Euclid Ave., Cleveland. (LBA Lighting and Starting.)  
 Branches: 136 West 52nd St., New York; 1191 Woodward Ave., Detroit; 2241 Michigan Ave., Chicago; 243 Monadnock Bldg., San Francisco.

### BATTERY EXTINGUISHERS.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.

### BLOW-OUT PATCHES. (See Patches.)

(Continued on Next Page.)

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## GET EVERY MILE

THAT YOUR GASOLINE  
HAS IN IT

# Polarine

puts the power in the  
drive wheels—all of it.

Polarine ends carbon  
troubles—stops friction  
and makes repair bills  
shrink.

Polarine your car.

In half-barrels and bar-  
rels, gallon and five-gal-  
lon cans.

Use Standard Oil  
Company's Gasoline

At All Dealers or

## STANDARD OIL COMPANY

OF NEW YORK





## (BUYERS' GUIDE—Continued.)



# EMCO

## AUTOMOBILE OIL

Is Strictly a Mineral Product

**T**HE efficiency of any lubricant for use in automobile cylinders depends entirely on the ingredients of which it is composed. If there is any animal, vegetable or acid matter which is subject to decomposition you can never expect anything but lubrication trouble. If, on the other hand, you use a lubricant refined strictly from pure Pennsylvania crude, mineral oil, your lubrication problem is solved for all time.

Emco is just such an oil. Refined here in the very heart of the Pennsylvania Crude Oil Fields, it is positively without an equal anywhere, as thousands of Emco users will testify. As proof of our confidence in Emco Oil, we offer it to the Automobile Public under the following guarantee:

### GUARANTEE

If Emco Oil does not prove satisfactory to YOU in absolutely every respect, we will refund your money in FULL—pay freight (both ways if oil is returned) and make no charge for oil used in trial.

If your dealer cannot supply you, we will ship Emco direct to you in five or ten gallon cans, barrels or half barrels.

### EMERY MANUFACTURING COMPANY

LEWIS EMERY, JR., Proprietor.

General Offices: 47 Main Street, Bradford, Pa.

Strictly independent refiners, manufacturing Deodorized Gasoline and Lubricating Oils of every description.

New York Branch:  
1010 U. S. Rubber  
Bldg., 58th and  
Broadway.

References:—  
Dun's, Bradstreet's  
or any National  
Bank.



### Dover Soap Economizer



Saves over one-third  
soap consumption

### Dover Electric Light Bulb Case

Safe and  
Very Compact



Send for  
1913 Catalogue

### DOVER SAVAL MEASURE AND FUNNEL



With Automatic Shut-Off  
Prevents Overflowing  
Oil Tank

DOVER STAMPING & MFG. CO., Cambridge, Mass.

# GOOD YEAR

AKRON, OHIO

This name on Automobile Tires and Rubber Accessories signifies inherent qualities of material and workmanship that insure the maximum of service at the minimum of expense.

THE GOODYEAR TIRE & RUBBER COMPANY, AKRON, OHIO (672)

When Writing to Advertisers, Please Mention The Automobile Journal.

### BODIES, TRUCK.

Motor Truck Body Co., 320 Franklin St., Detroit.

### BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

### BRAKE BANDING OR LINING.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (J-M Non-Burn.)

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)

Standard Woven Fabric Co., Framingham, Mass. (Multibestos.)

Branches: 903 Boylston St., Boston; 276 Canal St., New York; 720 Main St., Buffalo; 422 River St., Troy, N. Y.; 1427 Vine St., Philadelphia; 1430 Michigan Blvd., Chicago; 1598 Woodward Ave., Detroit; St. Louis; San Francisco.

### BRAKES.

Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

### BRUSHES, WIRE.

Williams Foundry & Machine Co., Akron, O.

### BUMPERS AND FENDERS.

Sager Co., J. H., 271 South Ave., Rochester, N. Y.

### CABLES. (See Wires.)

CARBON REMOVERS. (See Cylinder Cleaning Compound.)

### CARBURETORS.

Planhard Mfg. Co., 1790 Broadway, New York. (Planhard.)

Sumner, George, Inc., 1926 Broadway, New York. (S. U.)

### CARS—ELECTRIC PLEASURE.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)

Baker Motor Vehicle Co., Cleveland. (Baker.)

### CARS—GASOLINE PLEASURE.

Abbott Motor Co., 141 Waterloo St., Detroit. (Abbott-Detroit.)

Austin Automobile Co., Grand Rapids, Mich. (Austin.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Cole Motor Car Co., Indianapolis, Ind. (Cole.)

Empire Automobile Co., Indianapolis, Ind. (Empire, Little Aristocrat.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Henderson Motor Car Co., Indianapolis. (Henderson.)

Herreshoff Motor Co., 620 Harper Ave., Detroit. (Herreshoff.)

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Keeton Motor Co., Detroit. (Keeton.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

K-R-I-T Motor Car Co., Detroit. (K-R-I-T.)

Maxwell Motor Co., Inc., Detroit. (Maxwell.)

Mercer Automobile Co., 1100 Whitehead Road, Trenton, N. J. (Mercer.)

Michigan Motor Car Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)

National Motor Vehicle Co., 1033 22d St., Indianapolis. (National.)

Nordyke & Marmon Co., Indianapolis. (Marmon.)

Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)

Paige-Detroit Motor Car Co., Detroit. (Paige.)

(Continued on Next Page.)



(BUYERS' GUIDE—Continued.)

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)  
 Reo Motor Car Co., Lansing, Mich. (Reo.)  
 Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)  
 Stutz Motor Car Co., Indianapolis. (Stutz.)  
 White Co., The, 828 E. 79th St., Cleveland. (White.)  
 Branches: 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburgh, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.  
 Willys-Overland Co., Toledo, O. (Overland.)

CARS—STEAM PLEASURE.

White Co., The, 828 E. 79th St., Cleveland. (White.)  
 Branches: See Cars—Gasoline Pleasure.

CARS—GASOLINE COMMERCIAL.

Adams Bros. Co., Findlay, O. (Adams.)  
 Available Truck Co., 2334 Hamilton Ct., Chicago. (Available.)  
 Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)  
 Blair Mfg. Co., Newark, O. (Blair.)  
 Brown Commercial Car Co., Peru, Ind. (Brown.)  
 Cartecar Co., Pontiac, Mich. (Cartecar.)  
 Clark, E. S., 242 Freeport St., Dorchester District, Boston. (Clark.)  
 Dart Manufacturing Co., Waterloo, Ia. (Dart.)  
 Driggs-Seabury Ordnance Corp., Sharon, Penn. (Vulcan.)  
 Federal Motor Truck Co., Junction and Leavitt Sts., Detroit. (Federal.)  
 Garford Co., Elyria, O. (Garford.)  
 General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)  
 Branches: New York, Chicago, Boston, Philadelphia, Kansas City.  
 Gramm-Bernstein Co., Lima, O. (B. A. Gramm's.)  
 Knox Automobile Co., Springfield, Mass. (Knox.)  
 Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)  
 Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)  
 Reo Motor Car Co., Lansing, Mich. (Reo.)  
 Sullivan Motor Car Co., 1707 East Ave., Rochester, N. Y. (Sullivan.)  
 Willys-Overland Co., Toledo, O. (Overland.)

CARS—ELECTRIC COMMERCIAL.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)  
 Atlantic Vehicle Co., Factory, Newark, N. J.; 1600 Broadway, New York City; 10 Postoffice Sq., Boston. (Atlantic.)  
 Baker Motor Vehicle Co., Cleveland. (Baker.)  
 Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)  
 Branches: 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.  
 General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)  
 Branches: See Cars—Gasoline Commercial.  
 General Vehicle Co., Long Island City, N. Y. (G. V.)

CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Cartecar Co., Pontiac, Mich. (Cartecar.)  
 Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)  
 Branches: See Cars—Electric Commercial.  
 Knox Automobile Co., Springfield, Mass. (Knox.)  
 White Co., The, 828 E. 79th St., Cleveland. (White.)  
 Branches: See Cars—Gasoline Pleasure.  
 Willys-Overland Co., Toledo, O. (Overland.)

CATALOGUE SYSTEMS.

Catalogue Systems Co., Fisher Bldg., Chicago, Ill.  
 (Continued on Next Page.)

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# J. M. The proved - and approved - Shock Absorber

*Why is the J. M. Shock Absorber the most frequently imitated of any shock absorber on the market?*



For the same reason that counterfeiters imitate United States currency instead of Confederate money—because the

## J. M. SHOCK ABSORBER

*is the universally accepted standard*

Note that “universally,” please—remember that no other shock absorber has received even a fraction of the world-wide approval that the J. M. enjoys. Wherever civilization reigns, wherever automobiles run—the J. M. Shock Absorber is found on the best motor cars.

Nothing but proven merit can so standardize any article. The J. M. has based its case on scientific facts—not mere claims and generalizations. It has proved its case on all sorts and conditions of roads.

Have you seen the

## Wonderful Graphic Record of J. M. Efficiency

drawn by the auto itself,—the proof which convinced Earle M. Ovington, the famous aviator and technical expert? Have you heard why Westgard, the veteran pathfinder of the A. A. A., and Kohl, the ‘round-the-world motorist, both place absolute reliance on J. M. Shock Absorbers?

If not, write for our free booklet “D”—today, or call at any of the J. M. agencies. There is one in every leading city.

## The J. M. Shock Absorber Co., Inc.

210 S. 17th St., Philadelphia

AGENCIES: New York, N. Y., 218 W. 84th St.; Chicago, Ill., 1509 Michigan Ave.; Cincinnati, O., 801 Main St.; Buffalo, N. Y., Teck Building; Rochester, N. Y., 111 Monroe Ave.; Atlantic City, N. J., 12 S. Virginia Ave.; Cleveland, O., 5906 Euclid Ave.; St. Louis, Mo., 3029 Locust St.; Boston, Mass., 222 Elliot St.; Pittsburgh, Pa., 5919 Baum St.; Baltimore, Md., 10 W. Eager St.; Washington, D. C., 1803 M St., N. W.; Hartford, Conn., 230 Main St.; Los Angeles, Cal., 1256 S. Flower St.; San Francisco, Cal., Van Ness Ave. and Jackson St.; Jacksonville, Fla., 200 Lauro St.; Syracuse, N. Y., State and Cedar Sts.; Providence, R. I., 11 Dorrance St.; Erie, Pa.; Seattle, Wash.; Portland, Ore.; Orlando, Fla.

Foreign Branches in France, England, Germany, Russia, Belgium, Austria, Italy, Spain, Argentine Republic, South Africa and Australia.



## SAGER EQUALIZERS

The Shock Absorbers Which Save Your Car and Tires.  
Nothing to Wear, Adjust or Require Attention.  
They Take The "Sting" Out of Rough Roads.  
Try Them At Our Expense For 30 Days.

Seven Years Of Success.

ENDORSED BY:

Stoddard-Dayton  
Elmore  
Olds  
Rambler  
Saurer  
Lippard-Stewart  
Franklin  
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Maxwell  
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Dorris  
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Crawford  
Meteor  
and Jewel

THOUSANDS OF DOLLARS  
Saved Annually by Use of Sager Bumpers.  
Don't Wait for a "Smash-up" to Buy Protection.

DO IT NOW.

PRICES \$6.00 to \$27.50.

Liberal Discounts.  
Protection



Used Almost Exclusively On High Grade Cars.  
Channel



Rochester



Clamped on Bumpers of Distinction. 30 Models. Attached in 10 Minutes.  
FORD SPECIAL, CLAMPED ON, \$10.

**J. H. SAGER CO.**  
271 South Avenue, Rochester, N. Y.

## Cartercar

With the gearless transmission—will give better service than is possible for a gear car. Unlimited speeds—climbs steep hills—gives double the usual tire mileage.

**CARTERCAR COMPANY, Pontiac, Mich.** Send for catalog

**PAIGE** "36"—\$1275  
"25"—\$ 950

Leaders of popular-priced cars—thoroughly built, completely equipped, backed by a strong organization. Specifications and catalog on request.

**PAIGE-DETROIT MOTOR CAR CO.**  
306 21st Street, Detroit, Michigan

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## (BUYERS' GUIDE—Continued.)

### CEMENTS.

**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City.  
**Northwestern Chemical Co.,** Marietta, O. (Se-ment-ol Radiator.)

### CHAINS, TIRE, AND ANTI-SKIDDING DEVICES.

**Weed Chain Tire Grip Co.,** 28 Moore St., New York.

### CHAINS—TRANSMISSION OR DRIVING.

**Boyd, F. Shirley,** 903 Boylston St., Boston. (Baldwin.)  
**Miller, Chas. E.,** 97-103 Reade St., New York. (Bramp-ton.)  
Branches: See Accessory Manufacturers and Jobbers.)

### CLOCKS FOR DASHBOARDS, ETC.

**Boston Clock Co.,** 16 State St., Boston.  
**Chelsea Clock Co.,** 16 State St., Boston.

### CLUTCHES—AUTOMOBILE FRICTION.

**Brets Co., J. S.,** 250 W. 54th St., New York. (Hartford Cone.)

### COILS.

**Heinze Electric Co.,** Lowell, Mass.  
**New York Coil Co.,** 338 Pearl St., New York City.

### CONTROLLERS AND ECONOMIZERS.

**Moller Brothers Controller & Economizer Co.,** 700 Bets Bldg., Philadelphia. (M&M.)

### CYLINDER CLEANING COMPOUND.

**Milwaukee Auto Specialty Co.,** 128 Second St., Milwaukee.  
**Northwestern Chemical Co.,** Marietta, O. (Carbonox.)  
**Prest-O-Lite Company,** 271 East South St., Indianapolis. (Prest-O-Carbon Remover.)  
Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburgh, Providence, San Francisco, Seattle, St. Louis and St. Paul.

### FIRE EXTINGUISHERS.

**Northwestern Chemical Co.,** Marietta, O. (Fire-Fly.)  
**Pyrene Co. of New England,** 176 Federal St., Boston.

### FUNNELS, AUTO.

**Dover Stamping & Manufacturing Co.,** Cambridge, Mass. (Dover.)

### GASKETS.

**Brown Co., Inc., Chas. D.,** 49 Federal St., Boston. (Vel-lumold.)

### GAUGES.

**National Motor Supply Co.,** 1911 Euclid Ave., Cleveland. (Tire Pressure and Gasoline Tank.)  
Branches: In all principal cities.

### GEARS, STEERING.

**Ross Gear & Tool Co.,** 794 Heath St., Lafayette, Ind.

### GUNS, GREASE. (See Oil Pumps.)

### HEADLIGHTS.

**Sumner, George, Inc.,** 1926 Broadway, New York City. (Diva.)

(Continued on Next Page.)



# THE AUTOMOBILE JOURNAL. (BUYERS' GUIDE—Continued.)

91

## HORNS.

Dean Electric Co., Elyria, O. (Tuto.)  
Randall-Falchney Co., Boston. (Jericho, Jubilee.)  
Branch: 918 Eighth Ave., New York.

## HOUSES, PORTABLE STEEL.

Kelb Sales Co., 1790 Broadway, New York. (Ruby.)

## INSULATION.

Johns-Manville Co., H. W., Madison Ave. and 41st St.,  
New York City.

## LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)  
Branch: 1974 Broadway, New York.

## LICENSE NUMBER BRACKETS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.  
Branches: In all principal cities.

## LIGHTING SYSTEMS, ELECTRIC.

Apple Electric Co., Dayton, O. (Aplico.)  
Dean Electric Co., Elyria, O. (Dynalux.)  
Remy Electric Co., Anderson, Ind. (Remy.)

## LOCKS, AUTOMOBILE.

Bracelet Auto Lock Co., 32 No. Clark St., Chicago.

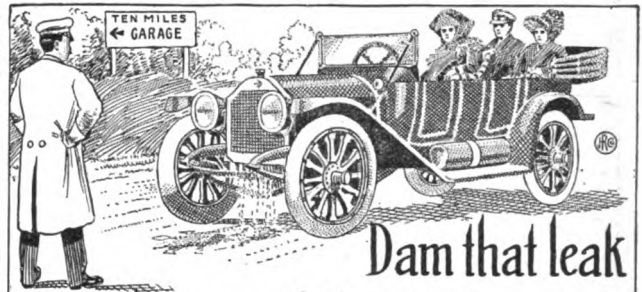
## LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York. (Colonial.)  
Branches: Boston, Fall River, Philadelphia.  
Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)  
Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagle-  
line No-Karbon.)  
Harris Oil Co., A. W., 326 South Water St., Providence.  
(Harris.)  
Branch: 143 No. Wabash Ave., Chicago.  
Hawn, Geo. A., 142-144 Front St., New York. (Panhard.)  
Branch: 899 Boylston St., Boston.  
Indian Refining Co., 17 Battery Place, New York. (Distributors of Havoline Oil.)  
Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Building, Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.  
Invader Oil Co., 80 Broad St., New York. (Invader.)  
Branches: 234 Columbus Ave., Boston; 113 Arch St., Philadelphia; 3556 11th St., N. W., Washington, D. C.  
Miller, Chas. E., 97-103 Reade St., New York. (Pan-American.)  
Branches: See Accessory Manufacturers.  
New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)  
Northwestern Chemical Co., Marietta, O. (Gear-Silence.)  
Standard Oil Co., New York. (Polarine.)  
Branches: In all cities.  
Texas Company, The, 7 West St., New York.  
Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.  
Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)  
Branches: 49 Federal St., Boston; 29 Broadway, New York; Fourth and Chestnut Sts., Philadelphia; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.; Fisher Bldg., Chicago; Ford Bldg., Detroit; Indiana Pythian Bldg., Indianapolis.  
Valvoline Oil Co., 27 State St., Boston. (Valvoline.)

## MAGNETOS AND SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York.  
Branches: 119-121 E. 24th St., Chicago; 1250 Wood-  
(Continued on Next Page.)

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## Dam that leak

Do it with Se-ment-ol. Pour it into your radiator. It dissolves in the water, flows thru the cooling system. Cooled by the air when it strikes the leak it congeals and cements the cavity making a permanent repair.

After the cement has "set" drain radiator and re-fill with fresh water.

CARBONOX—The logical carbon remover. Does not dissolve the carbon; but attacks the "charred" oil that binds the flakes of carbon to one another and to the metal. The loosened carbon is then blown out thru the exhaust.

Price 75¢ at dealers.

THE NORTHWESTERN CHEMICAL CO.  
Marietta, Ohio.

**SE-MENT-OL**  
SELF-ACTING RADIATOR CEMENT  
THE NORTHWESTERN CHEMICAL CO.  
MARIETTA, OHIO

## Abbott Detroit

"The demand of the day is that an organization shall be judged by its product and not by what it claims for itself." Keep this in mind when you examine the 1913 models of the Abbott-Detroit.

Advance Catalog on Request.

ABBOTT MOTOR CO.

141 Waterloo St.

Detroit, Mich.

"Built for Permanence"

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Jackson, Mich.

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Heinze Electric Co., Lowell, Mass. (Heco.)

Marburg Bros., 1790 Broadway, New York. (Mea.)

Remy Electric Co., Anderson, Ind. (Remy.)

Splittdorf Electrical Co., 98 Warren St., Newark, N. J.

Branches: 10-20 W. 63rd St., New York; 1110 S.

Michigan Ave., Chicago; 180-182 Massachusetts

Ave., Boston; 1028 Geary St., San Francisco; 972

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Philadelphia; 1823 Grand Ave., Kansas City; 1628

Broadway, Seattle, Wash.; London, Eng.; Buenos

Aires.

## MASTER VIBRATORS.

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## MEASURES.

Dover Stamping & Manufacturing Co., Cambridge,  
Mass. (Auto and Savol.)

## MIXING DEVICES, GASOLINE.

Approved Auto Specialties Co., 1731-37 Broadway, New  
York. (Wolf.)

Royal Equipment Co., 422 Housatonic Ave., Bridge-  
port, Conn. (Gyrex.)

## MOTORCYCLES AND SUPPLIES.

American F. N. Co., Boston. (F. N.)

Branches: 49 Union St., Providence; 415 Trumbull  
St., Hartford, Conn.

Miami Cycle & Manufacturing Co., 320 Hanover St.,  
Middletown, O. (Flying Merkel.)

## MOTORS AND POWER PLANTS.

Rutenber Motor Co., Marion, Ind. (Rutenber.)

## MOTOR STARTERS.

Apple Electric Co., Dayton, O. (Aplco.)

Remy Electric Co., Anderson, Ind. (Remy.)

## PACKING, FIRE.

Johns-Manville Co., H. W., Madison Ave. and 41st St.,  
New York City.

## PAINT, ANTI-RUST.

Anti-Rust Paint Co., Dept. 7, Akron, O. (Thomas.)  
Northwestern Chemical Co., Marietta, O. (Never-Rust.)

## PATCHES.

Invincible Puncture Proof Tire Co., 53 Sabin St., Provi-  
dence. (Invincible.)

National Motor Supply Co., 1911 Euclid Ave., Cleveland.

## POLISH.

International Metal Polish Co., Quill St. and Belt R.  
R., Indianapolis, Ind. (Blue Ribbon.)

Johns-Manville Co., H. W., Madison Ave. and 41st St.,  
New York City.

Northwestern Chemical Co., Marietta, O.

## PRIMERS.

Interstate Auto Accessory Co., Indianapolis. (Ideal.)

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The Motor Truck (Commercial Car) Monthly, \$1.00 the  
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Branches: See Horns.

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Dewey-Anderson Co., Toledo, O. (Dewey Power.)

## RADIATOR CONNECTORS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

## RIMS—REMOVABLE AND DETACHABLE.

Boyd, F. Shirley, 903 Boylston St., Boston. (Dorian.)  
Firestone Tire & Rubber Co., Akron, O.  
Branches: In all principal cities.  
Standard Welding Co., Cleveland. (Stanweld.)  
United States Tire Co., Broadway and 58th St., New York. (Continental and Whittlesey Demountable.)  
Branches: New York, Chicago, San Francisco.

## ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York. (Tarvia.)  
Branches: Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburg, Cincinnati, Kansas City, Minneapolis, New Orleans, Seattle, London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

## SHIELDS, MOTOR.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (Asbestos.)

## SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Boyd, F. Shirley, 903 Boylston St., Boston.  
J. M. Shock Absorber Co., 210 So. 17th St., Philadelphia. (J. M.)  
Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)  
Sumner, George, Inc., 1926 Broadway, New York. (Velvet Auxiliary, Acme.)

## SOAPS.

Hopewell Bros., Newton, Mass. (Paos.)  
Branch: 1974 Broadway, New York.  
Northwestern Chemical Co., Marietta, O. (Dermalene.)

## SPARK PLUGS AND IGNITERS.

American Ignition Co., 319 Adams St., Dorchester, Mass. (Amico.)  
Bosch Magneto Co., 223-225 W. 46th St., New York.  
Branches: See Magnetos and Magneto Supplies.  
Heinze Electric Co., Lowell, Mass. (H. E. Co. Priming.)

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are free from soot-producing ingredients. They keep the motor clean, insuring the utmost power.

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And Every Drop Counts".

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is the ideal gear-case lubricant. It is a pure oil reduced to the consistency of a grease. It will pay you to get better acquainted with HARRIS OIL products. They are "America's Leading Lubricants".

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Any motor car maker will equip with it if you state plainly you want nothing else, no matter what speedometer he may list in his catalog as equipment.

Write us for facts, test and experiments that show Jones supremacy beyond question.

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The Completely Equipped Empire  
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Equipment includes Mohair Top and Top  
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THE CAR THAT MADE

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Three Great Models. Pilot 40, four-cylinders, 41-2x5. Brake test, 53 horse power. 120-in. wheel base. Price, \$2000. Pilot 50, four-cylinders, 41-2x6. Brake test 59 horse power. 126-in. wheel base. Price, \$2250. Pilot 60, six-cylinders, 4x6. Brake test 67 horse power. 132-in. wheel base. Price, \$2,500.

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**Mosler, A. R., & Co., P. O. Box M, Mt. Vernon, N. Y. (Spit Fire.)**  
**Randall-Falchney Co., Boston. (MacKae.)**  
 Branches: See Horns.  
**Spitttdorf Electrical Co., 98 Warren St., Newark, N. J.**  
 Branches: See Magnetos and Magneto Supplies.  
**Standard Co., The, Torrington, Conn. (Black Eagle.)**

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**Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.**  
**Randall-Falchney Co., Boston. (Mac-Kae Blitz.)**  
 Branches: See Horns.

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**Interstate Auto Accessory Co., Indianapolis. (Ideal.)**

### SPEEDOMETERS, RECORDERS, ETC.

**Hoffecker Co., The, Motor Mart, Boston. (Hoffecker.)**  
**Jones Speedometer, New Rochelle, N. Y.**  
 Branches: Broadway and 76th St., New York; 109 Massachusetts Ave., Boston; 1416 Vine St., Philadelphia; 1430 Michigan Ave., Chicago; 853 Main St., Buffalo; 253-255 Jefferson Ave., Detroit; 530 Golden Gate Ave., San Francisco; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.  
**Northwestern Chemical Co., Marietta, O. (Hydrometers and Thermometers.)**  
**Service Recorder Co., 2245 East 105th St., Cleveland. (Servis.)**  
**Stewart-Warner Speedometer Corp., Chicago. (Auto-Meter.)**  
 Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330 1/2 North Illinois St., Indianapolis; 1613 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia; 5940 Kirkwood Ave., Pittsburg; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

### SPRINGS FOR AUTOMOBILE SUSPENSION.

**Marburg Bros., Inc., 1790 Broadway, New York. (Marburg-Hagen.)**  
**Perfection Spring Co., No. 1 Plant, 2414 Superior Ave., N. W.; No. 2 Plant, East 65th and Central Ave., Cleveland.**

### SPROCKETS.

**Boyd, F. Shirley, 903 Boylston St., Boston. (Baldwin.)**

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**Standard Welding Co., Cleveland.**

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**Sealfe & Sons Co., Wm. B., Pittsburg, Penn.**  
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 Branches: See Cylinder Cleaning Compound.

### TANKS FOR FUEL AND WATER.

**Sealfe & Sons, Wm. B., Pittsburg, Penn.**  
 Branch: New York City.

(Continued on Next Page.)



## (BUYERS' GUIDE—Continued.)

## TANKS, TIRE INFLATING.

**Prest-O-Lite Co.**, 271 East South St., Indianapolis.  
(Baby Tire Filler, The Emancipator.)  
Branches: See Cylinder Cleaning Compound.

## TAPE—ASBESTOS.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St.,  
New York City.

## THERMOS CASES.

**Dover Stamping & Mfg. Co.**, Cambridge, Mass.

## TIRE ACCESSORIES.

**Firestone Tire & Rubber Co.**, Akron, O.  
Branches: See Rims—Removable and Detachable.  
**Shaler Co.**, C. A., Waupun, Wis.

## TIRE CASES.

**Hopewell Brothers**, Newton, Mass. (Hopewell.)  
Branch: 1974 Broadway, New York.

## TIRE CHAIN GRIPS. (See Chains.)

## TIRE PRESERVATIVES AND PROTECTORS.

**Approved Auto Specialties Co.**, 1731-37 Broadway, New  
York. (Goodman Tire Shield.)  
**Northwestern Chemical Co.**, Marietta, O. (Tire-Lac.)

## TIRES—CASINGS AND INNER TUBES.

**Braender Rubber & Tire Co.**, Rutherford, N. J.  
(Braender.)

**Cataract Rubber Co.**, Wooster, O. (Cataract.)  
Branches: Boston, New York, Providence.

**Dayton Rubber Mfg. Co.**, Dayton, O. (Dayton Airless.)  
**Firestone Tire & Rubber Co.**, Akron, O. (Firestone.)  
Branches: See Rims—Removable and Detachable.

**Fisk Rubber Co.**, Chicopee Falls, Mass. (Fisk.)  
Branches: 811-813 Boylston St., Boston; 17½ Dor-  
rance St., Providence.

**Gaulois Tire Co.**, 1926 Broadway, New York. (Gaulois.)  
**Goodyear Tire & Rubber Co.**, Madison St., Akron, O.  
(No-Rim-Cut.)

Branches: In all principal cities.  
**United States Tire Co.**, Broadway and 58th St., New  
York. (Continental, G & J, Hartford, Morgan &  
Wright.)

Branches: See Rims—Removable and Detachable.  
**Walpole Tire & Rubber Co.**, Walpole, Mass. (Walpole.)

## TIRES—CUSHION.

**Cataract Rubber Co.**, Wooster, O. (Cataract.)  
Branches: Boston, New York, Providence.

**Firestone Tire & Rubber Co.**, Akron, O. (Firestone.)  
Branches: See Rims—Removable and Detachable.

**Mots Tire & Rubber Co.**, The, Akron, O. (Electric  
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Angeles.

## TIRES—SOLID AND COMMERCIAL.

**Firestone Tire & Rubber Co.**, Akron, O.  
Branches: See Rims—Removable and Detachable.

**Fisk Rubber Co.**, Chicopee Falls, Mass.  
Branches: See Tires—Casings and Inner Tubes.

**Goodrich Co.**, B. F., Akron, O. (Goodrich.)

**Mots Tire & Rubber Co.**, The, Akron, O. (Mots.)  
Branches: See Tires—Cushion.

**Polack Tire and Rubber Co.**, 246 W. 59th St., New York  
City. (Polack.)

**Republic Rubber Co.**, Youngstown, O. (Republic.)

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### J-M SPARK PLUG

If it fails to make good you get another plug. The only plug sold with such a definite guarantee. It is also the only plug with a *double insulation*—mica wound around the electrode, and a porcelain shell over the mica. Either of these insulations is sufficient to insure perfect sparking without short circuit—even when current is supplied by a magneto.

All sizes can be used for battery or magneto ignition. Sold by most dealers, or shipped prepaid. Price \$1.00 each.

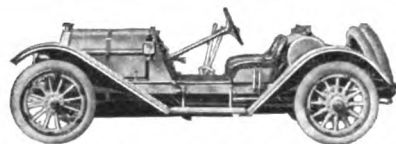
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THE CANADIAN H. W. JOHNS-MANVILLE CO., LTD.  
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Type 35  
Series J  
Raceabout  
Guaranteed  
Speed—Mile in  
51 Seconds



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Some desirable territory open. Write today.

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## VALVOLINE OIL CO.

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### Automobile Oils

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A STEADY SPARK  
AT ANY R.P.M.



HECO MAGNETOS are the product of experts specialized in the electrical business. They embody all that the electrical industry knows about magnetos.

By our special method of winding the secondaries we are able to positively guarantee them against burning out or breaking down.

HECO MAGNETOS supply a spark of equal intensity for any number of revolutions per minute.

We also make the well-known HECO COILS, and HECO COMBINATION PRIMERS and SPARK PLUGS. Let us send you our complete catalog.

**HEINZE ELECTRIC COMPANY**  
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Sales Office, Detroit, Mich.

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"The Steady Hand"

## Speedometer



Accurate, durable—the one speedometer with a daily trip register that can be set at any mileage at any time.

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Motor Mart—Main Offices—Boston, Mass. PRICES \$25 to \$135

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Dorian Demountable Rims.  
Supplementary Spiral Springs.                      R. I. V. Ball Bearings.

## CAMERON CARS      \$975

All Up-To-Date Features

Four cylinder, water cooled, 30 H. P. Four forward speeds. 112 in. wheelbase. Left hand drive, centre control. Starts from seat. Pointed hood, beautiful lines and finish. Equipment unsurpassed at the price.

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Branches: See Rims—Removable and Detachable.

#### TOPS AND ATTACHMENTS.

**Springfield Metal Body Co.,** 20 Medford Ave., Springfield, Mass.

#### TROUBLE FINDERS.

**Hopewell Brothers,** Newton, Mass. (Vibrator.)  
Branch: 1974 Broadway, New York.

**TRUCKS AND TRACTORS—**(See Cars, Commercial.)

#### TRUNK RACKS.

**Connecticut Steel & Wire Co.,** Hartford, Conn.

#### TUBING, GAS.

**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City.

#### TURNABLES.

**Beach Co.,** T. C., 108 Ottawa St., St. Johns, Mich. (Beach.)

#### UNIVERSAL JOINTS.

**Bretz Co.,** J. S., 520 W. 54th St., New York. (Hartford.)

#### VALVE GRINDERS.

**Wall, J. H.,** 290 Hope St., Bristol, R. I. (Ford.)

#### VALVE LIFTERS.

**Winsor Manufacturing Co.,** Providence, R. I.

#### VOLTMETERS—(See Ammeters.)

#### VULCANIZERS.

**National Motor Supply Co.,** 1911 Euclid Ave., Cleveland. (Garage and Individual.)  
Branches: In all principal cities.

**Shaler Co.,** C. A., Waupun, Wis. (Shaler.)

**Vanderpool Co.,** Springfield, O.

**Williams Foundry & Machine Co.,** Akron, O.

#### WELDING, AUTOGENOUS.

**Autogenous Welding Equipment Co.,** Springfield, Mass.

#### WELDING OUTFITS.

**Prest-O-Lite Co.,** 309 W. South St., Indianapolis. (Prest-O-Welder.)

Branches: See Cylinder Cleaning Compound.

#### WELDING STEEL.

**Standard Welding Co.,** Cleveland.

#### WHEELS.

**McCue Co.,** The, Buffalo, N. Y. (Wire.)

#### WIRE MECHANISM.

**Bretz Co.,** J. S., 250 W. 54th St., New York. (Bowden.)

#### WRENCHES AND COMBINATION OUTFITS.

**Allen Wrench and Tool Co.,** Providence, R. I. (Allen Friction Socket Sets.)

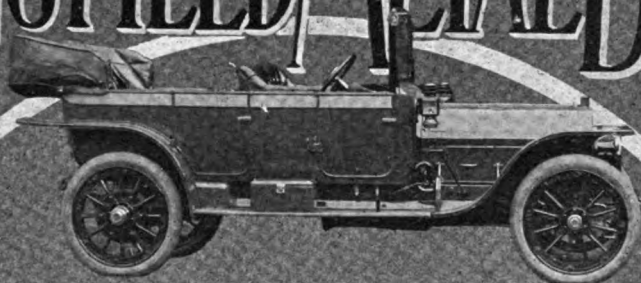
**Coe's Wrench Co.,** Worcester, Mass.

**Cutter, George A.,** Taunton, Mass.

**Walworth Manufacturing Co.,** Boston. (Stillson.)

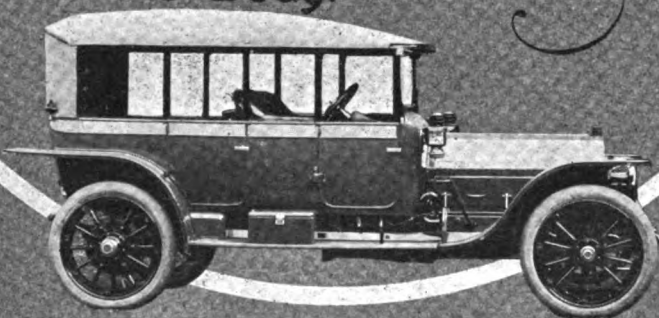


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Springfield Convertible Bodies  
A Construction Giving the  
Qualities of a Limousine & Tour-  
ing Equipment That May Be Con-  
verted as Quickly as a Folding Top  
Can be Raised or Lowered. When  
folded the Full Space of the Touring  
Car is Available — When Raised It  
Is a Regular Top or It Can Be Glass  
Enclosed.

Dealers, Who Insist on Quality  
Equipment, Specify The Springfield  
Convertible Body.



# SPRINGFIELD, MASSACHUSETTS



# The two Imperators

Both made in Germany





VOL. XXXVI.

NO. 4.

# AUTOMOBILE *JOURNAL*

\$1.00 the year  
10 cents the Copy

PAWTUCKET R.I.

September 25, 1913

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For Perfect  
Lubrication of  
Automobile



And Marine  
Gasoline Engines

This OIL is NOT AN EXPERIMENT, here today and gone tomorrow, but has for many years maintained the highest reputation as a scientifically prepared lubricant which is properly filtered, so that it burns clean, without leaving carbon deposits on plugs or cylinders.

The biggest engine manufacturers in the East and in the West recommend it; thousands use it on Touring and Racing Automobiles, and Working, Cruising and Racing Motor Boats, and all are pleased to find that

*“It Makes a Difference”*

**INDIAN REFINING COMPANY, Inc.**

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NEW YORK CITY



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1913 Edition  
Now Ready

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Important Event of  
the Season



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CHAS. E. Miller's Annual Catalog has come to be universally recognized as the standard dictionary of the American automobile accessory and supply industry. It is more than a business aid. It is a reference work which is used by thousands for this purpose every day in the year.

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Boston, Mass.

Bridge and Dwight Sts.,  
Springfield, Mass.

274 Trumbull Street,  
Hartford, Conn.

135 Central Ave.,  
Albany, N. Y.

Prices the same at the above branches as in New York City.

Send your name and address *now* with 5 cents postage (to cover cost of mailing) for a free copy of this valuable book.

**CHAS. E. MILLER,** Manufacturer, Jobber, Exporter and Importer, **97-99-101-103 Reade St., New York City**

ESTABLISHED 1896





**THE FEAT  
OF STARTING A  
SELF-CRANKER**

is a beautiful feat for

**PRETTY FEET**

**HOMELY FEET**

**WEB FEET**

**FLAT FEET**

**ANY OLD FEET**

**JUST PUSH A BUTTON  
and the SELF-CRANKER does the job  
if an**



**STORAGE BATTERY**

**is used with it to furnish the initial energy.**

*Write us for full information*

**Willard Storage Battery Co.  
CLEVELAND, OHIO**

New York Branch—136 West 52d Street  
San Francisco Branch—243 Monadnock Building  
Indianapolis Branch—438 & 439 Indiana Pythian Bldg.

Detroit Branch—1191 Woodward Avenue  
Chicago Branch—2241 Michigan Avenue

*Depots in all Principal Cities in the United States, Canada and Mexico*

(56)

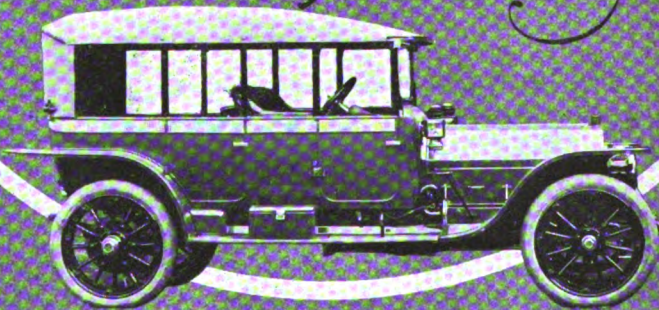


# SPRINGFIELD METAL BODY CO



Springfield Convertible Bodies  
A Construction Giving the  
Qualities of a Limousine & Tour-  
ing Equipment That May Be Con-  
verted as Quickly as a Folding Top  
Can be Raised or Lowered. When  
folded the Full Space of the Touring  
Car is Available - When Raised It  
is a Regular Top or it Can Be Glass  
Enclosed.

Dealers, Who Insist on Quality  
Equipment, Specify The Springfield  
Convertible Body.



# SPRINGFIELD, MASSACHUSETTS

When Writing to Advertisers, Please Mention The Automobile Journal.



# The Standard Brake Lining

Every Industry Has Its Standard. In  
Brake Lining Circles The Standard Is

TRADE MARK  
**Raybestos**  
REG. U.S. PAT. OFF.

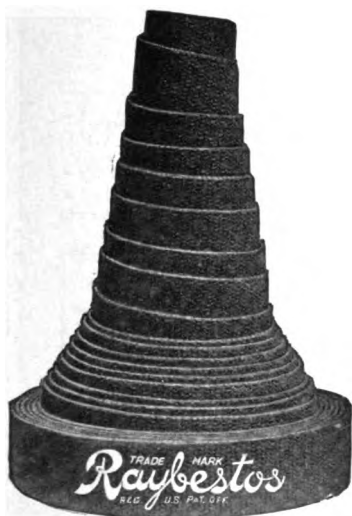
**"THE ORIGINAL AND BEST ASBESTOS BRAKE LINING"**

RAYBESTOS is the original heat-proof facing. By scientific weaving, rolling and treating, RAYBESTOS becomes a wall of strength, capable of resisting intense heat.

There are on the market many cotton linings. They are cheaper than RAYBESTOS but soon burn out. Asbestos, which cannot burn, is the base of RAYBESTOS.

The motorist, dealer, manufacturer, ALL realize the predominance of RAYBESTOS. It grips and holds—it is always ready for service.

When you overhaul your brakes demand RAYBESTOS. A little care in this will save you trouble and expense later on.



**It Made The Automobile Safe.**

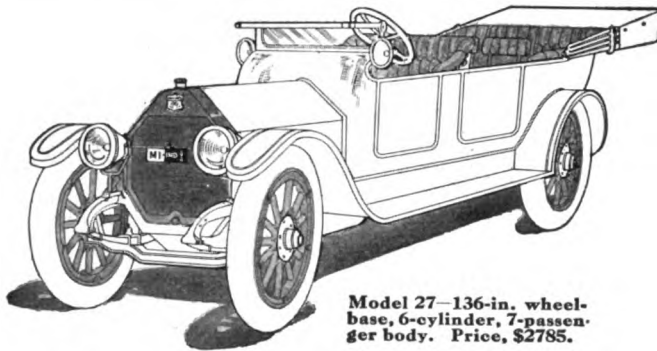
**THE ROYAL EQUIPMENT COMPANY**

**Railroad & Bostwick Aves.,  
Bridgeport, Conn.**

*We also make Raymond and Duplex Brakes and Gyrex the Mixer.*

When Writing to Advertisers, Please Mention The Automobile Journal.





Model 27—136-in. wheel-base, 6-cylinder, 7-passenger body. Price, \$2785.

## "What Can I Do to Pull People In?"

This was one auto dealer's problem as he stood in the door of his salesroom and watched the people go by. "If I could get one prospect out of one hundred to come in and see my car, I could retire in a few years."

THE CAR THAT DRAWS THE BUYERS—

# HAYNES

*America's First Car*

## With the Vulcan Electric Gear Shift

Automobilists want to see this car as much as you want them to. Car owners again in the market are especially interested in the Haynes. They realize the convenience and comfort of simply pressing a push-button instead of tugging at a refractory gear lever and making monkeys of themselves when slowed down by traffic or climbing hills.

### Specifications of the New Haynes

**Motor**—Bore 4 1-4 in., Stroke 5 1-2 in. L-head Haynes. Cylinders cast in pairs. Model 26, A.L.A.M., 43.35 H. P., Dynamometer 65 H. P. Model 27, A.L.A.M., 43.35 H. P., Dynamometer 65 H. P. Model 28, A.L.A.M., 29.9 H. P., Dynamometer 48 H. P.

**Weight**—Model 26, 3800 lbs., Model 27, 4000 lbs., Model 28, 3400 lbs.

**Cooling**—Centrifugal pump and pressed steel fan.

**Wheel Base**—Model 26, 130. Model 27, 136. Model 28, 118.

**Ignition**—American Simms' Magneto.

**Carburetor**—Stromberg.

**Lubrication**—Splash and gravity feed.

**Control**—Left hand. Vulcan Electric Gear Shift.

**Transmission**—Selective Type, three speeds forward, one reverse.

**Steering Column**—Worm and worm gear type.

**Clutch**—Haynes contracting steel band.

**Rear Axle**—Full Floating Timken on Models 26 and 27; McCue, Model 28, Gourney Bearings.

**Front Axle**—I-Beam. O. H. steel heat treated.

Hand lever shift optional at \$200 reduction.

**Wheels**—Artillery type. Funk demountable rims.

**Tires**—Models 26 and 27, 36x4 1-2. Model 28, 34x4.

**Springs**—Front Semi-elliptic 39 1/4x2, rear 48x2.

**Brakes**—15 1-4 external and 15 internal Models 26 and 27. 12 and 16 internal on Model 28.

**Finish**—Indiana dark blue body. Pacific Tour gray, optional.

**Gasoline Feed**—Pressure, Automatic feed.

**Upholstery**—Buffed leather. Deep cushions.

**Starting and Lighting**—Leece-Neville electrical system.

**Cowl-board Equipment**—Electric lights, sight oil feed, automatic cut-out for generator, dash light, auxiliary air pressure pump, air gauge and speedometer. Models 26 and 27 have rim wind clock.

**Other Standard Equipment**—Top, top cover of silk mohair, mechanical tire pump, rain vision ventilating wind-shield, Vulcan Electric Gear Shift, two large electric head lights, electric side lights, electric tail light, full dash equipment, electric starter, generator, 12 volt, 80 ampere hour storage battery, horn, coat and foot rails, tire irons, full tool equipment, one extra demountable rim and Collins curtains. Models 26 and 27 have shock absorbers.

The Haynes salesroom is the Mecca of automobile prospects and sales are being made quick and frequent

When Writing to Advertisers, Please Mention The Automobile Journal.



# GET HEP!

## No high cost of selling among Haynes dealers

The cost of selling automobiles has steadily advanced. Instead of handing them out in first-come-first-served order, most automobile dealers face a serious problem in disposing of their cars.

There's no "getting-rid" problem for Haynes dealers. The cars are literally selling themselves.

## No come-backs, either

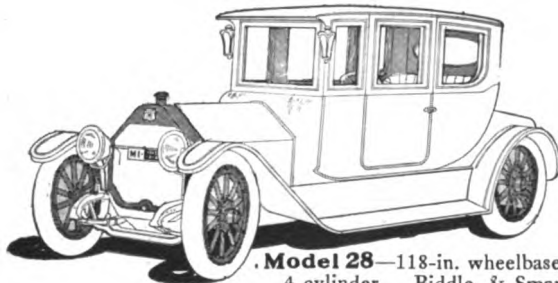
Haynes cars stay sold. No continual, annoying returns on the part of Haynes buyers for petty repairs and adjustments. Haynes cars are so simple, so strong, so fool-proof that they reduce the come-backs to almost nothing.

**And the season's greatest selling feature  
to help you**

## The Vulcan Electric Gear Shift

is a thoroughly proven success—entirely worthy of a place in the Haynes. It is 100% efficient and the slickest working bit of mechanism you ever laid eyes on. It is creating all kinds of business for Haynes dealers. It is a ten-strike—get it working for you.

**The Haynes Automobile Co., 6 Main St., Kokomo, Indiana**



**Model 28**—118-in. wheelbase,  
4-cylinder. Biddle & Smart  
coupe body. Price, **\$2700**





The tendency toward all-metal construction has become an irresistible movement in all lines of building. Steel is used for the framework of buildings, bridges, etc. It provides protection against fire and elements and makes open, web-like construction possible, at the same time supplying the means of securing flexibility required by any structural work which carries a tremendous load.

In almost every means of transportation, railway coaches, steamships, automobiles, etc., where high speed is required steel construction demonstrates its superiority over wood. While the more compact construction made possible by the use of steel is desirable, its greatest benefit is the factor of safety that accrues.

Wire wheels are the last and most important wood replacement in automobile development, the last step in making the motor car what it should be, a creature of steel throughout.

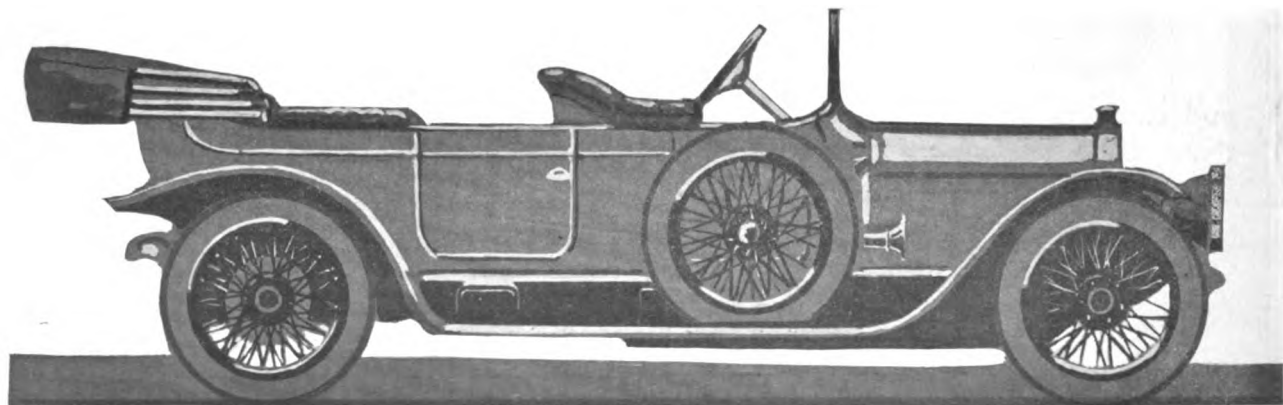
McCue Wire Wheels are built along the most modern conception of wire wheel construction. Standard S spokes, made by the Standard Company of Torrington, Conn., are used. With McCue Wire Wheels the weight of the car is suspended equally from all points on the rim and the rim itself, impervious to weather, is light, thus relieving the tire of the extra pound, pound, pound which the heavy wooden rim subjects it to. Steel rims also conduct the molecular and frictional heat away from tires and prolong their life more than fifty per cent.

McCue Wire Wheels provide a factor of safety in proportion to their strength—seven times that of wooden wheels in their capacity to support loads, and fifteen times the strength of wooden wheels to resist side thrust such as comes from skidding, etc.

Write us for booklet describing the development of wire wheels, causes which brought about their use, and their superiority when compared with the ordinary artillery type wheel.

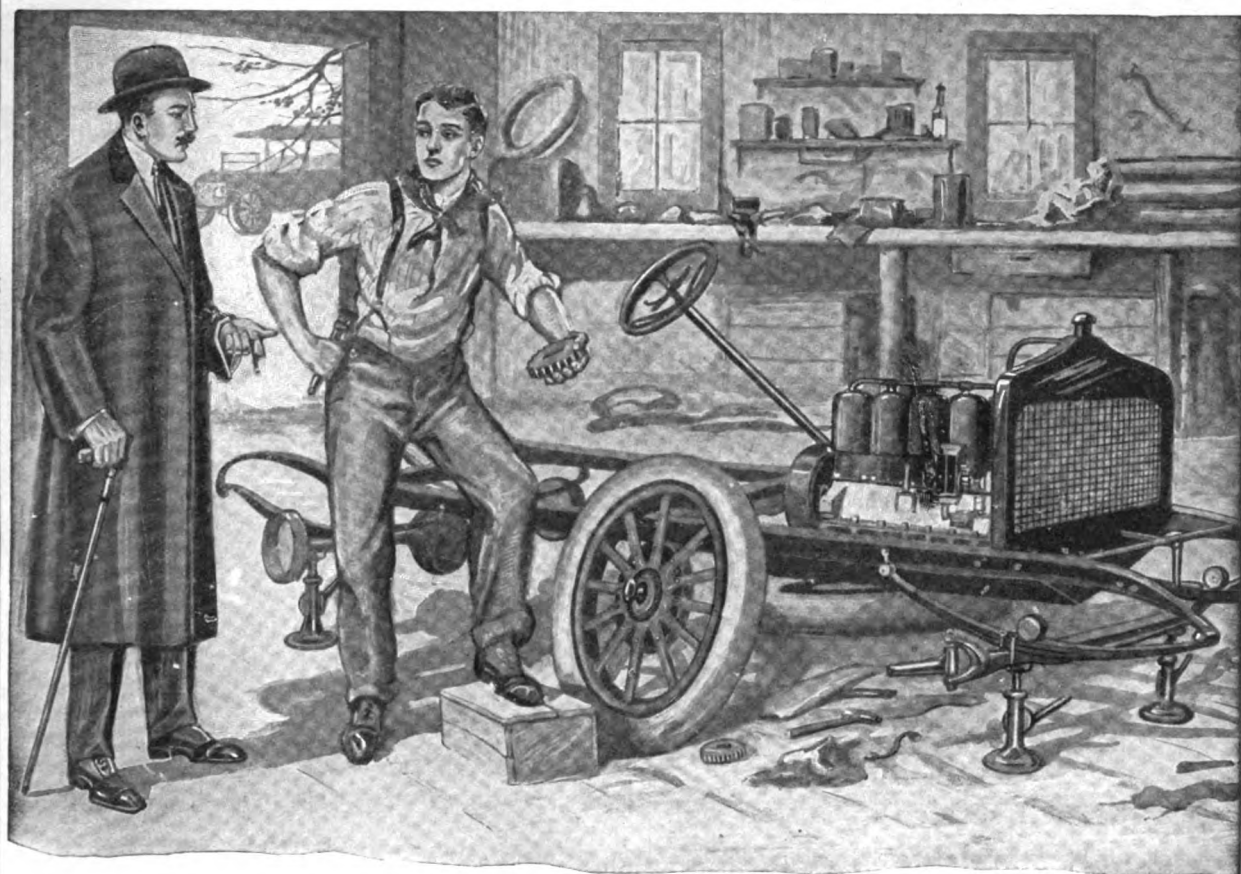
## THE McCUE COMPANY

### Buffalo, New York



When Writing to Advertisers, Please Mention The Automobile Journal.





## When the Repair man performs the Autopsy

he finds, nine times out of ten, that *poor lubrication* has caused all the costly havoc. Then he asks the simple question,



“Why don't you use  
TRADE MARK  
**NON-FLUID OIL ?**  
REGISTERED IN  
UNITED STATES PATENT OFFICE



and he tells in his honest way what he, as a mechanic, knows about the depredations of cheap lubricants.

## Why don't you use **NON-FLUID OIL?**

Get the genuine in orange colored cans.

### New York & New Jersey Lubricant Co.,

165 Broadway, New York

Chicago, 1430 Michigan Ave.

Philadelphia, 1431 Vine St.

When Writing to Advertisers, Please Mention The Automobile Journal.





# COES

## THE Wrench Supreme

Strength without bulk or clumsiness.

Ease of handling without slipping or bruising.

Perfect balance and right grip

Everything the motorist desires in a wrench is to be found in the "COES" AUTOMOBILE MODEL, and you will never know perfect wrench service until you pin your faith to it.

It stands to reason that the 5 per cent. more you pay for a "COES" wrench goes for 60 per cent. more quality and service—put this wrench in the tool kit and shop. You will get your money's worth.

Send for Literature Now.

---

### Coes Wrench Co.

WORCESTER, MASS.

J. C. McCARTY & CO.,

21 Murray St., New York City

JOHN H. GRAHAM & CO.,

113 Chambers St., New York City

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# Stewart Speedometer

MAGNETIC PRINCIPLE

## The most important miles on the dial

One of the most important speeds a car *must* maintain—and must have indicated *exactly* in order to maintain—is the low speed required by city traffic rules which is often as low as 6 miles per hour.

The *only* instrument that indicates these low speeds is the *magnetic type* speedometer.

No other speedometer shows any sign of life until its whirling parts have enough momentum—never under seven to fourteen miles per hour.

The magnetic Stewart begins to register when the car begins to move. It accurately and unfailingly indicates speed *from zero up*. It is the only speedometer which surely indicates every mile or fraction below fourteen miles—the most important miles on the dial.

This is another reason for the 800,000 Stewart Speedometers in use compared to the 200,000 of all other makes combined.

See that you have a Stewart on *your* car.

### The Stewart Speedometer Factory

1926 Diversey Boulevard, Chicago, U. S. A.

Service Stations in all important cities all over the world

• The most popular •  
Speedometer in the World

When Writing to Advertisers, Please Mention The Automobile Journal.



# Three Autos Are Owned in Brookline for Every Four Families in the Town

Brookline, Mass., is the richest town in the world; its assessed valuation is \$111,000,000; it leads the country in preponderance of women among its population.

*In this town there are 74 Boston Heralds (including evening edition) bought and read every day, for every hundred families.*

The Boston Herald has compiled a booklet which tells how many autos are owned in the 48 cities and towns that make up Greater Boston. The booklet gives, besides, much other information that every automobile advertiser should possess himself of.

If you are interested, write to Advertising Manager, The Boston Herald, and ask for

**“A Handbook for Advertisers.”**

When Writing to Advertisers, Please Mention The Automobile Journal.





*The*  
**AV**  
(A. VERMERSCH & CIE)

The Small,  
Compact, Efficient,  
Hydraulic-Spring  
**Shock Absorber**

"Made like a gun"

"Rides like a motor boat"

At last a hydraulic-spring shock absorber that is only 7 1-2" high and produces the maximum of car economy and comfort.

**THE A. V.**  
(A. Vermersch et Cie)  
**SHOCK ABSORBER**  
Front and Rear

For both pleasure cars and commercial vehicles. A combination of the best features of hydraulic and spring shock absorbers, together with the most advanced improvements.

**\$35 Per Pair and Up**

Made in France and sold with remarkable success throughout Europe.

We are arranging exclusive agents in every town

and city throughout the country. Do not lose the opportunity but write quickly or telegraph.

**HUDSON EXPORT & IMPORT COMPANY**

140 West 42nd Street

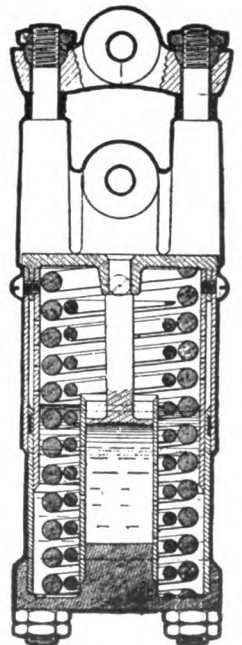
New York City

**RHINELAND MACHINE WORKS CO.**

1254 Michigan Avenue, Chicago, Ill.  
650 Woodward Avenue, Detroit, Mich.

**JOHN V. WILSON COMPANY**

1424 Vine Street, Philadelphia, Pa.  
220 Motor Mart, Boston, Mass.



When Writing to Advertisers, Please Mention The Automobile Journal.



# The King of TIRES CATARACT

## Supremacy Due To Service Alone

No costly advertising campaign or corps of silver-tongued salesmen have enabled the

### Cataract Tires

to reach their position of Supremacy.

Tire Service to the owner alone has caused them to forge ahead. We build them right, of the best materials and workmanship, with the result that they cost less per mile than any other tire produced.

*Equip To-day with  
Cataract Tires and  
Eliminate Your Tire  
Troubles.*

**4,000 Mile Guarantee**

**CATARACT RUBBER  
COMPANY**

**WOOSTER, OHIO**

New England Branch—66 Hereford Street  
BOSTON, MASS.

NEW YORK

PROVIDENCE, R. I.



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# Overland

## 1914

### \$950

*With Gray & Davis electric starter and generator—\$1075  
Prices f. o. b. Toledo*

***A larger, more powerful  
and more finely finished  
car in every respect.***

***But the price is lower  
than ever.***

***1914 catalogue on request.***

***Please address Dept. 52***

Full electric lights  
Storage battery  
35 horsepower motor  
114-inch wheelbase  
Timken bearings

33 x 4 Q. D. tires  
Clear vision windshield  
Brewster green body  
with light green striping,  
nickel and aluminum trimmings

Mohair top and boot  
Stewart  
speedometer  
Electric horn

**The Willys-Overland Company, Toledo, Ohio**





# 10 Automobile Mechanical Books 10

ENGINE—MAGNETO—CARBURETOR—BATTERY—ELECTRIC LIGHTING—TIRES—CHASSIS  
—OPERATION—OVERHAULING, REBUILDING AND REPAIRING—THE MOTORCYCLE.



## Automobile Mechanical Books

### A Library of Automobile Mechanical Information

800 Pages of Text—1500 Illustrations—Half a Million Copies Sold Annually.

Knowledge of your car means additional pleasure in its use and decreased cost in operation and maintenance. The practical instruction that you need is to be found in these books, and to acquire the same fund of information in any other manner would require years of constant study. You must understand your motor if you would adjust or repair it. The subject is fully treated in the Engine book. This applies as well to the Magneto, Carburetor, Battery, Lighting, Chassis and Tire books. When overhauling and rebuilding, read that discussion. The book on Motor Car Operation covers that subject with reference to all cars. No matter what the need, there is a book to meet it. No car or component is neglected, and all standard engines, magnetos, carburetors, batteries, lighting systems and vehicles are dealt with. The full set includes:

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|-------------------------------|--------|--|--------|---|--------|
| Engine .....                  | \$ .35 | Motor Car Tires .....                          | \$ .25 | Magneto .....                               | \$ .35 |
| Carburetor .....              | .35    | The Motor Car Chassis .....                    | .25    | Motor Car Operation .....                   | .50    |
| Lighting by Electricity ..... | .50    | Motorcycle Construction, Care and Repair ..... | .35    | Overhauling, Rebuilding and Repairing ..... | .50    |
| Battery .....                 | .35    |  |        |   |        |

Full Set, 10 Books.....\$3.75

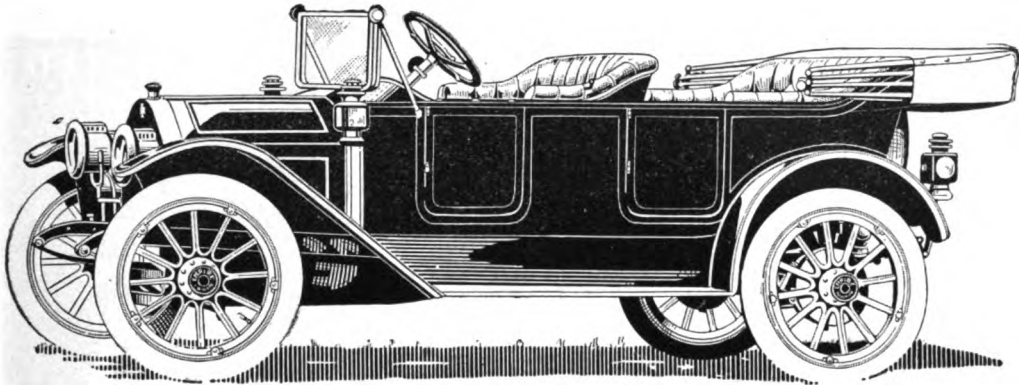
### JUST COMPLETED AND READY FOR SALE

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| Motor Truck Construction, Operation, Care and Repair—Right up to the minute | \$1.00 |
| A B C of Aerial Navigation  | \$1.00 |

(Working Plans and Specifications of All Standard Models—American and Foreign Motors Described)

**The Automobile Journal Publishing Company**  
Times Building, Pawtucket, R. I.





# EMPIRE

*"The Little Aristocrat"*

**THE** Empire "31" had proved itself a masterpiece of engineering skill and the most solidly constructed car of moderate price.

Its marvelous run in the Indiana-Pacific Tour from Indianapolis to the finish at Los Angeles in perfect condition is a record never before achieved by a car of its size and power.

Empire Dealers and owners all over the country are enthusiastic over the service given by this car and are coming back for more Empires.

When we launched this model we went out for the progressive dealers who knew cars and the public's demand. In two months we were swamped with orders which left hundreds of dealers without Empire contracts.

We immediately began to plan for increased 1914 production. Now, after months of preparation we are turning out four times as many cars and we are consequently in a position to allot territory which we could not supply last season.

In every important territory where we have distributors we have had in the last few months solicitous notes from other dealers who realized too late the popular success of the Empire.

There is still some open territory, but it won't last long. Tomorrow may be too late to secure territory now open.

*Write for advance folder for 1914.*

## EMPIRE AUTOMOBILE COMPANY

INDIANAPOLIS, IND., U. S. A.



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**FOR SALE**—Party, soon to leave the state, will dispose of their elegant 1912 Regal, seven-passenger 40 H. P. Touring Car; fully equipped; has been used very little; will demonstrate; price low for quick sale. E. C. GLINES, 33 Eddy St., Providence, R. I.

**EVERY CAR OWNER SHOULD USE ELECTRIC POLISHING CLOTHS.** Keep the new car from looking old and shabby and make the old car look like new. No. 1 cloth removes all spots and stains. No. 2 cloth gives a hard dry polish that will not gather dust. Saves half the time in washing. Price 50 cents a set by Parcel Post. Order now. A. & R. Co., Wallingford, Conn.

IMITATED  
BUT NOT  
DUPLICATED

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THE OIL THAT SUITS  
AND DOES NOT SOOT.

Carbon in your cylinders means loss of power. Customers report 10,000 to 15,000 miles with no carbon troubles. A good motto: TRY ANYTHING ONCE. EAGLEINE NO-CARBON AUTO OIL is furnished in 1.5-10 gallon, 30 and 50 gallon Steel Drums with faucets for which no extra charge is made.

EAGLE OIL  
AND SUPPLY CO.

104 BROAD STREET. BOSTON, MASS.





# STOP

!!!!!!

Imagine  
a  
plug  
that  
will  
last  
forever



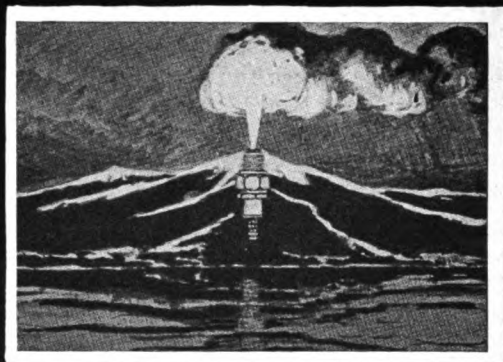
# WATCH

!!!!!!

Mosler

# Vesuvius

Plug



AS POWERFUL AND AS  
INDESTRUCTIBLE AS THE  
FIRES OF VESUVIUS

WE CARRY IN STOCK  
A PLUG FOR EVERY  
Internal Combustion Engine Built

**A. R. MOSLER & CO.**  
P.O. Box "M," MT. VERNON, N. Y.



## PUBLISHER'S COMMENT.

The Annual Electric Vehicle Number of Motor Truck, October issue, undoubtedly will prove of great interest to the thousands of readers of The Automobile Journal. No special edition ever published by a commercial car journal will equal this number, either in character or value of contents. It will be an invaluable book of reference, because of the scope of the special articles dealing with the construction, care, operation and maintenance of electrically propelled machines, prepared by the most widely known men in all branches of the industry. The price of 15 cents a copy will not be advanced. Order now—direct, or through your news dealer.

In these days of comfort and convenience in motoring, automobile owners are particularly interested in the new things offered by manufacturers of accessories and supplies. The special department devoted to this subject, on pages 35-36-37, is worthy of your careful attention.

The increasing interest in the cyclecar has made it imperative that The Automobile Journal create a new department for its consideration. The first mechanical descriptions of this newest feature of the automobile industry are to be found on pages 51-52-53.

When in need of new fittings or supplies, or when considering the purchase of a new car or truck, always consult the Buyer's Reference and Guide, beginning on page 87. The concerns represented therein have gained a reputation for standard products that merits your attention and patronage.

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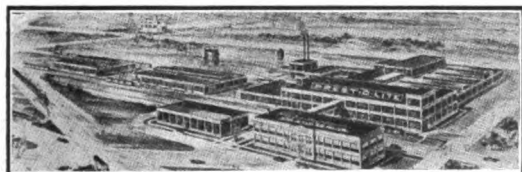
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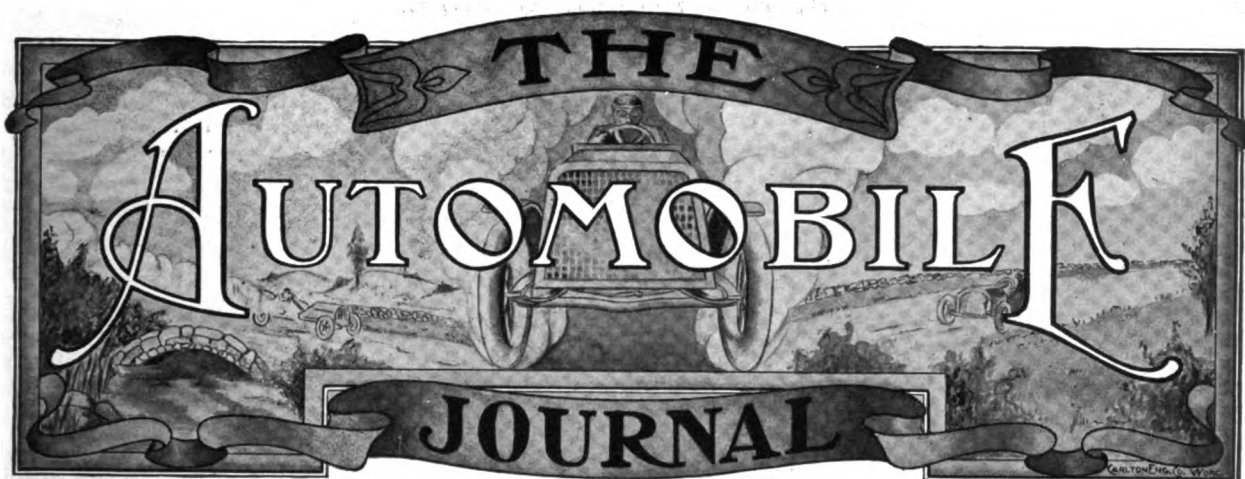
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VOL. XXXVI, No. 4

SEPTEMBER 25, 1913

Price, \$1.00 the Year

## THE NATIONAL HIGHWAYS ASSOCIATION.

**An Organization Fostering a Great Public Movement for the Construction and Maintenance of Trunk Highways at Federal Expense—Outlining Its Purposes and the Methods by Which It Expects to Attain Success.**

**W**HILE motorists, especially, have come to realize the importance of giving consideration to the wise application of the funds available for good roads, few have appreciated the magnitude of the subject. That the time is fast approaching, if indeed it is not already here, when the general public is to become actively interested in the matter, is borne out by the remarkable growth of the National Highways Association. This organization was perfected and the association incorporated under the laws of the District of Columbia early in 1912. Less than two years, therefore, have been devoted to the promulgation of its aims and purposes. Today, its membership approaches the 100,000 mark—a certain indication of the immense popularity of its position regarding this important matter.

Every great public movement has its inception in the mind of some individual, and its success or failure depends largely upon the personality of that individual. The Na-

tional Highways Association surely is a great public movement. It had its inception in the mind of Charles Henry Davis, and since the personality of this man must be reflected in its objects and the methods of attaining results, the history of the association begins with that of Mr. Davis.



**Charles Henry Davis, C. E., Founder and President, National Highways Association.**

Charles Henry Davis has personally, or by inheritance, been identified, directly or indirectly, with road building for three generations, or substantially since roads, as such, were built in this country. His grandfather, Edward Morris Davis of Philadelphia, early became identified with road construction work in a commercial way. This commercial interest was maintained and further developed by a son, Henry Corbit Davis, and, naturally, the grandson not only inherited the business, but still further developed its possibilities.

Through this connection, Charles Henry Davis became decidedly active in the general good roads movement throughout the country, with a





**Poor Road—Slippery Surface—Dangerous.**

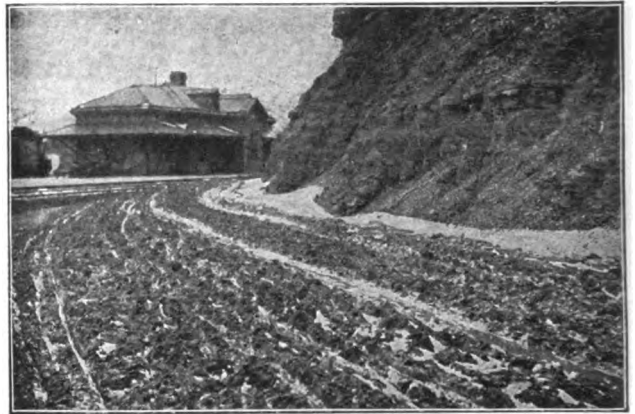
splendid opportunity to study the needs of the people in this regard. It was while thus engaged that it was made apparent to him that the national government should participate in highway building. Careful consideration of the subject from all its angles led him to the conclusion that the only method of convincing the body politic was through the formation of an association devoted to such a cause. As a result the National Highways Association was founded, and shortly thereafter he disposed entirely of his interests in the business, so that the new association should be absolutely divorced from commercialism in all its phases.

Mr. Davis is a very wealthy man, and, because of his prominence in the industrial world, he had little difficulty in interesting and securing the assistance, from the first, of a large number of men somewhat similarly situated. Gen. Coleman Du Pont, United States senator from Delaware, and a man who has taken a deep interest in good roads, having presented his home state

with an improved highway extending from one end of the commonwealth to the other, became chairman of the board of councillors. For a time Mr. Davis hesitated to accept the presidency, but his associates very soon assured him that the success of the organization depended very largely upon its proper direction, and that it was his duty as founder to accept this responsibility.

It will be seen that Mr. Davis already had arranged his business activities so that he could devote a major portion of his time to the association. He not only has done this, but he has contributed largely from his private fortune to the needs of the organization, so that the present growth is in no small measure due to his untiring efforts in its behalf.

The National Highways Association came into being at a time when the value of good roads had received general acknowledgment. The work

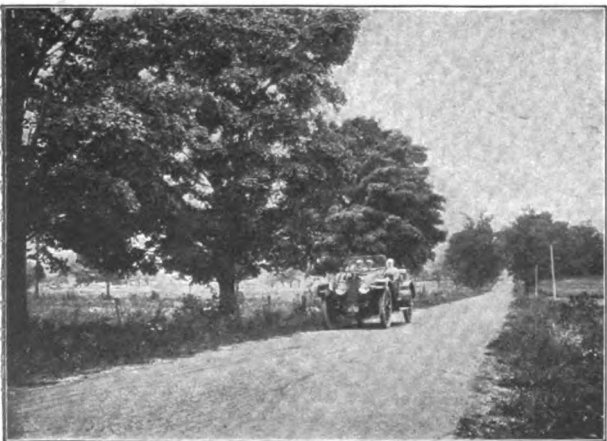


**Poor Roads—Farm to Railroad—Poor Way.**

accomplished by organized motorists and others had brought the matter to the attention of the public in such manner as to leave no doubt as to the advisability of investing funds in permanent ways. The purpose of the new association was in the nature of an advance step, in that it aimed to find the proper solution of the problem presented through the wise application of the funds available or to be made available.

Supplementing the work of other organizations, the National Highway Association has sought to bring directly home to the motorist, the farmer, the business man, and all interests, the advisability of securing improved highways as quickly as may be practical. To this end, the situation has been given very careful study. Contrasting pictures, examples of which are shown herewith, have played their part in awakening popular interest in this phase.

The association believes in a national high-



**Good Road—Good Surface—Safe.**

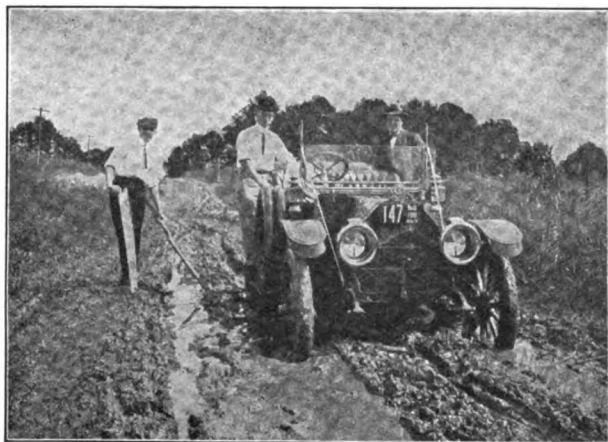


ways system. It states its position with respect to the situation as follows:

Whether the national government shall or shall not help in the construction of the highways of the nation is of vital and pressing importance to all our people. France, Germany, England, and, in fact, most European countries, have great highways. In the United States no such roads exist to any relative extent. We grew as a nation with the industrial growth of the world. About 1831, when we were young, railroads and street railroads were first built. A little later came the telegraph, and then the telephone. We likewise had great rivers, such as did not exist in many other industrial nations. These five means of transportation had a tendency to confine our road building to local centres. In Europe, the need of intercommunication came before the use of steam or electricity. Hence the earlier growth of road building on that continent.

We have over 2,000,000 miles of highways in the United States. The excess over 2,000,000 miles is, approximately, the only part of this vast system of roads which can be considered as improved—and these are not permanently improved. The cost of improving this 2,000,000 miles can be estimated as somewhere between a minimum of \$6,000,000,000 and \$20,000,000,000 or more.

The improvement of these highways will not come at once, either in time or, on first building, in permanence.



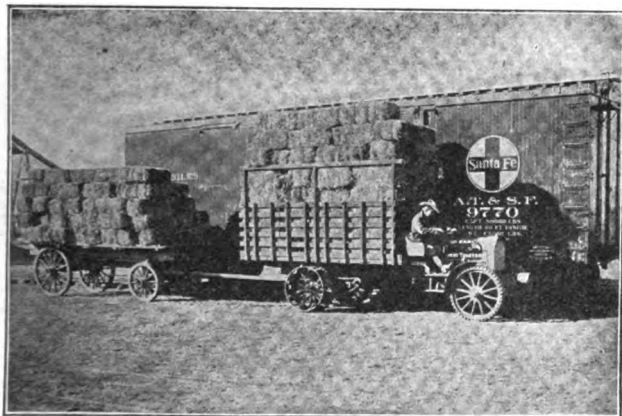
**Poor Road—Time Is Money—Delay Means Dollars.**

Economic, because of the nation-wide reduction in cost of distribution which will be attained. Social, because of the opportunity and encouragement to the country folk to come in contact with their fellow men, women and children—especially the last two. They can get this by no other means. Such a great question should not be lightly decided. No large appropriation should be made without deep study and forethought—without knowing the way we should go and where we should land.

The National Highways Association and other advocates of national roads favor the construction of a system of trunk lines—about 50,000 miles in all—connecting the principal cities of the country, entirely at the expense of the government and under government control. These advocates believe that the states should build certain secondary roads entirely at the state's expense and under state control; and that the counties should build a third class of roads entirely at the county's expense and under county control. This, in a general way, is the plan on which the French road system is based.

The advocates of federal aid for road building do not favor the construction of transcontinental trunk lines for highways at the government's expense. They believe that the government should go into partnership with the states and should pay either a per cent. or a fixed amount a mile for various hard roads; that the government should apportion its money among the states and let the states spend it.

On a small scale, this experiment of giving aid has been tried both by counties and states. In this country roads were first built by the small communities, villages, towns and townships. Some of these communities built them well and maintained them well. Others did not. Those that had good roads found business gravitating to them. They found that about three-quarters of the traffic



**Good Roads—Farm to Railroad—Good Way.**

Their history will be that of railroads—constant rebuilding and improvement. Add to either figure of cost what the imagination may choose to add and we have a future expenditure on the highways of the nation greater than the present investment in all other means of intercommunication—railroads, trolleys, telegraph, telephone, horse and power vehicles, and the postal service. This expenditure will cover many years; if accomplished within the same period as our railroad development, then about 80 years. The wise planning and building of these highways is an important public duty.

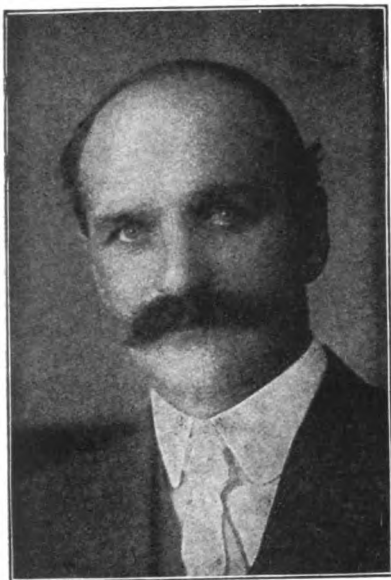
In maintaining that the national government should join in road building, the National Highways Association differs from other organizations in the plan to be adopted. One class asks for federal aid, in which government appropriations are to be apportioned among the states to be spent on state roads. This association stands for a system of national highways, built and maintained by the national government. Concerning this phase it expresses itself as follows:

The subject is one of the greatest, material, economic and social questions to be rightly solved by the nation. Material, because of the vast sums to be expended.



**Good Road—Time Is Money—No Delay.**





Gen. Coleman Du Pont, Chairman,  
Board of Councillors.

certainly, not good roads. In many cases, more than half of the money was wasted; half of it never got to roads. Under those circumstances the people soon began to demand that the counties should build county highways, and this the counties did to advantage; that is, county roads were built and paid for by the county. The county engineers and commissioners had charge of the spending of the money and maintenance of the roads, and all was well once more until something happened.

History repeated itself. Those counties that built county roads found that business gravitated to them from adjacent counties. Large communities developed within counties where good roads were built and maintained, and the growth of these large communities brought more people to that county and more business. Soon about three-quarters of the traffic over these county roads came from adjacent counties that did not help build or maintain these roads. The counties at once applied to the state, and curiously enough the same mistake was made as that which had been made before. The states gave aid to the counties, and again graft and corruption developed, and not good roads. And again, half of the money never went to roads. Then people demanded that the state should take over state highways and build and maintain them through a central body, by furnishing the

over their roads came from adjacent communities that did not help pay for the roads. Trouble ensued at once, with the result that the town applied to the county for assistance on the ground that the entire county was using these good roads and, therefore, must help pay for them and maintain them.

At first the county responded by what was known as county aid. That is, the county appropriated money. The money went to the town authorities and they spent it. But this was found undesirable, because it encouraged graft and corruption and all that went with these things, and did not go into roads—certainly, not good roads.

engineers, letting the contracts, inspecting the work and maintaining the roads.

Most, if not all, states that have tried state aid have found it practically unworkable, not only because of the dual means of raising funds jointly through the states and counties, and, sometimes, municipalities and individual assessments, but also because of the conflict of management between the several organizations of the government. Accordingly, most of the states have turned to state highway construction without the assistance of county, city or village finance or authority.

Having presented its arguments, the National Highways Association lays before the public its plan for accomplishing that which it believes desirable. It maintains that the building of these trunk highways must be done by the national government



A. L. Westgard, Vice President.

work has been undertaken, and no large appropriation has been made therefor without a careful preliminary investigation and report to Congress, thus enabling that body to act wisely and with discretion. To this end the association has prepared and had introduced in Congress, the following bill "to create a national highways commission and prescribing its powers and duties":

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled:

Section 1. That a commission is hereby created, to be called the "National Highways Commission," to investigate, collect information and report to Congress on the highways of the United States, together with recommendations as to the proper policy of the national government in respect thereto (whether by the establishment of a system of national highways or by federal aid in the building of state roads or otherwise) and as to the most appropriate legislation to carry such policy into effect.

Sec. 2. That the national highways commission shall consist of a chairman as the executive head in responsible charge



General View of Association's "Workshop," South Yarmouth, Mass.





**The Drafting Room, Where Every Highway in the Country Is Plotted on Its Respective State Map, Constantly Revised and Corrected.**

thereof and 13 additional commissioners as an "advisory council."

Sec. 3. That the President, by and with the advice and consent of the Senate, shall appoint said commission as follows:

First: That the chairman shall be or have been an engineer by education and profession and shall be a man of executive and business experience.

Second: The chairman shall be selected from candidates nominated to the President, one by each of the following associations: (Such as, the American Society of Civil Engineers, the American Automobile Association, the American Road Builders' Association, the National Grange, Farmers' Union, and any other representative national associations specially concerned with highway development. In this section should also be suitable provision for the manner of making such nominations.)

Third. The 13 members of the advisory council shall be respectively qualified to represent the following interests in the body politic: (1) Agriculture, (2) commerce, (3) construction, (4) economics, (5) education, (6) engineering, (7) finance, (8) legislation, (9) maintenance and traffic, (10) materials and machinery, (11) military, (12) transportation, (13) travel, touring and recreation. (This enumeration is merely tentative; the intention being to name all of the general interests of the country which are directly concerned in the development of a system of national highways.)

Fourth. Vacancies occurring in the commission shall be filled in the same manner as hereinbefore provided for original appointments.

Fifth. Any member of the commission shall be subject to removal by the President for inefficiency, neglect of duty or malfeasance in office.

Sec. 4. That the chairman shall receive a salary of \_\_\_\_\_ dollars per annum and each other commissioner a salary of \_\_\_\_\_ dollars per annum.

Sec. 5. That the powers and duties of the chairman shall be: (In this section should follow an enumeration of powers and duties in sufficient detail to indicate the extent to which the commission is required to investigate and to give the chairman the fullest possible power to carry out such investigation. The following points in particular should be covered: (1) Executive direction of work; (2) appointment and removal of employees; (3) providing offices, laboratories, etc.; (4) collection, tabulation and publication of information, including experimental work, surveys, etc.; (5) obtaining information and co-operation from

governmental departments; (6) incurring necessary expense; (7) preparing and submitting a complete final report with recommendations.)

Sec. 6. That the duty of the advisory council shall be to assist the chairman as he may direct and to advise with him at his request or on their own initiative.

Sec. 7. That the term of office of the commissioners and their successors appointed hereunder shall end upon the delivery of their final report to the President, but not later in any event than \_\_\_\_\_ 19\_\_\_\_.

Sec. 8. That for the purpose of carrying out the provisions of this act, there is hereby appropriated the sum of \_\_\_\_\_ dollars, out of any money in the treasury not otherwise appropriated.

Sec. 9. That this act shall be known as the national highways act; and shall take effect upon its passage.

In the meantime, the association is carrying on the necessary campaign of education. Its headquarters for this purpose are located at South Yarmouth, Mass.—on quiet

Cape Cod. Here, on property donated to the use of the association, by President Davis, has been erected a work shop, made up of several buildings which have been joined so as to present a novel and interesting establishment.

The main office building is a long, low structure, 127 by 34 feet. Down the entire length of this room, on one side, are the drafting tables. On the other side are the desks occupied by the association's publicity department. Down the middle of the room is a long file of safes and filing cabinets. At right angles to this office runs another long building, almost as large, in which are the office of the president, the mailing room, the filing room and the shipping departments. Connected with this, by a passageway, is the stenog-



**The Printing Department, in Which the Latest Mechanical Equipment Is Utilized in Issuing Circular Letters and Press Bulletins.**





**The Stenographers' Room, Where the Rapidly Increasing Correspondence of the Association Is Handled.**

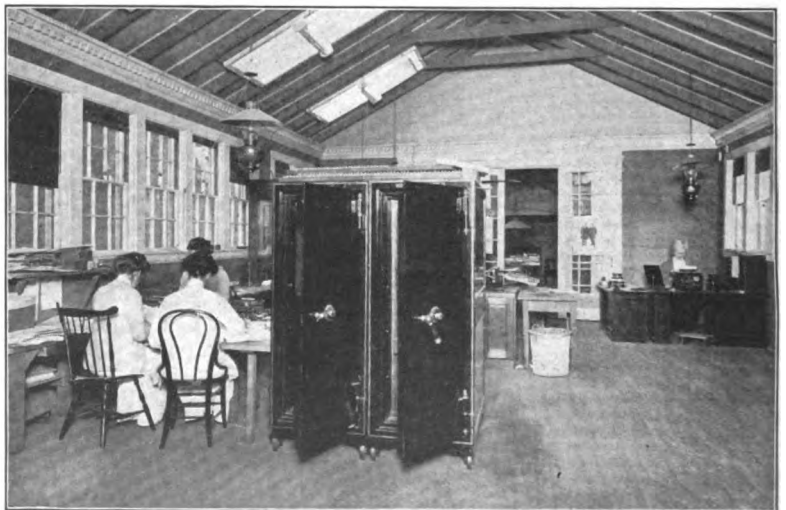
raphers' room, and adjoining that is the printing department, where the latest and most improved mechanical equipment has been installed. Here are printed and distributed various circular letters and bulletins, the work of printing, folding, sealing and stamping being done by automatic machines.

Nearly 40 persons are employed at the South Yarmouth establishment, and none the least important of these is the corps of eight draftsmen. These men have long been engaged upon the production of road maps, delineating thereon the existing roads in every state in the Union. The association is in constant correspondence with the highway commissioners and officials of all the states. The maps are always up-to-date, every piece of highway work contemplated or under construction being reported immediately to the association and transcribed to its proper place on the map of that state. These maps will prove of inestimable value to the proposed national highways commission, and in addition will be of service in showing the people of each state how the national government can make use of their roads in the proposed plan.

This is the workshop of the association. Other offices are maintained throughout the country. The actual headquarters of the association are located in the McLachlen building, Washington, D. C. A branch office, of the privileges of which the members of the associa-

tion are urgently invited to avail themselves, is maintained at 18 Old Slip, New York City. The headquarters of the organization department, which is under the direction of the Hon. Jesse Taylor, are at 515 Hartman building, Chicago. A large corps of workers is under Mr. Taylor's direction, among these being O. W. Gruening, manager of the northwestern organization department, in the Des Moines Life building, Des Moines, Ia.; E. L. Emery, field organizer for the intermountain district, at Boise, Idaho, and the Hon. W. A. Alsdorf, manager of the northeastern organization department, whose territory covers the Atlantic states.

Probably no one man connected with the association in an official capacity is better known among motorists than Vice President A. L. Westgard, who is at present engaged in traversing some 17,000 miles of roads throughout the entire country. This is by no means new work for Mr. Westgard, who has intimate, personal knowledge of practically every highway worthy the name in the United States, through his pathfinding trips during the past 21 years. For 13 years, between 1892 and 1905, he had charge, as chief of the work, of a large corps of engineers, making state, county and town maps and atlases throughout all the states east of the Rockies. The first automobile maps of the eastern states were made by him. Mr. Westgard's co-operation with the drafting department of the



**A Portion of the Filing Department, Where the Data Compiled by the Association Are Instantly Available at All Times.**



association, makes this feature of the work of undoubted worth.

The association has eight classes of membership as follows: Founders, who pay \$25,000 in one payment for life; national, \$10,000; collective (corporations, etc.), \$2500; life, \$1000; sustaining, \$100 annually; contributing, \$10 annually; assisting, \$5 annually; and subscribing, \$1 annually. In addition there is an associate membership for men, women and children, without the right to vote, with dues of 50 cents a year. The founders, limited to 53, are distributed geographically, so far as possible and represent the nation at large. The national members are limited to two from each state, territory or dependency of the United States.

Already several good roads associations throughout the country have become affiliated with the national body, becoming either departments or divisions of the parent association. One of the most effective branches of the organization is the council of governors, composed of the present governors of 44 states and territorial divisions of the United States, and it is anticipated that shortly this list will be increased to include them all.

The officers of the association are: President, Charles Henry Davis, C. E.; chairman, board of councillors, Gen. Coleman Du Pont; vice presidents, A. L. Westgard; Dr. Lucien Peters McCala, Boise, Idaho; Judge J. M. Lowe, Kansas City, Mo.; Jesse Taylor, Jamestown, O.; general secretary, Frederic Remsen Hutton, M. E.; assistant treasurer, Francis Hill Bigelow; consulting engineer, Arthur H. Blanchard, C. E., New York City; secretary, board of councillors, Elias Vander Horst, C. E., New York City; engineer, board of councillors, Timothy W. Sprague, Boston; director of publicity, C. H. Claudy, Washington, D. C.

The magnitude of the undertaking is at once apparent. These men and those associated with them must be regarded as the pioneers in a movement which is expected to result in immense value to the nation as a whole. The work, in spite of the wonderful progress that has been made within the past two years, has really only just begun. It is pointed out that the passage of the proposed bill will in no wise commit the federal government to the policy of the association in its final analysis, although, of course, those who advocate national highways built and maintained by the national government anticipate there will be no difficulty in demonstrating to the satisfaction of such a commission that this is the only proper method of procedure.

## DOTY IS NOW MANAGER.

### Succeeds Webb Jay as Head of Chicago Haynes Motor Car Company.

Webb Jay, vice president and manager of the Haynes Motor Car Company, Chicago, distributor for Haynes automobiles in Iowa, Illinois, Wisconsin and a part of Indiana, has disposed of his holdings in the concern, and has been succeeded as manager by Harry E. Doty. Mr. Doty has been connected with the automobile industry and kindred lines practically since he left college, and has a large number of friends all over the Middle West.

His first job was railroading. Then he became a salesman for the Liberty Cycle Company of Chicago, winning the position of western manager. Graduating from that business, he accepted a similar position with the Consolidated Rubber Tire Company, where he remained for 6.5 years. Later he became identified directly with the automobile business and became Pacific Coast manager of a manufacturing concern, which position he relinquished to join the Chicago selling company about a year ago. When a new manager was needed, it is stated that no other person was considered.

## WITH HANDLEY COMPANY.

### E. H. Horton and T. O. Jones Assume New Duties with This Organization.

The J. I. Handley Company, Indianapolis, Ind., sole selling agent for Marion and American cars, announces the appointment of E. H. Horton as sales manager of the Marion division, and T. O. Jones as publicity manager. Both men are recent acquisitions from the R-C-H Corporation of Detroit.

Mr. Horton was sales manager of the R-C-H organization since its formation, meeting with decided success in marketing the product of this concern. Previously he had been connected with the sales department of the Chalmers Motor Company. Mr. Jones is one of the best known publicity men in the industry. His early experience was gained in five years of newspaper work in Columbus, Grand Rapids and Detroit. He then became publicity manager for the Hupp Motor Car Company, being one of a party of three which made a trip around the world in a little Hupmobile in 1910 and 1911. He joined the R-C-H organization at its formation.



## COOLING BY WATER INJECTION.

IN A paper read by Prof. Bertram Hopkinson, F. R. S., of Cambridge University, England, at a meeting of the Institution of Mechanical Engineers at Cambridge, the results of a series of experiments in a new method of cooling gasoline engines were outlined. Instead of utilizing jackets or fins, the water is introduced in the

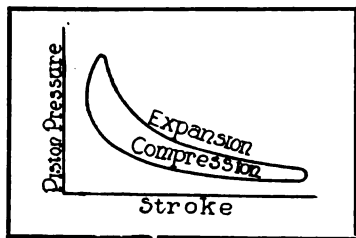


Fig. 1—Engine Pressure Diagram.

form of spray into the combustion chamber, but only injected during the ignition or expansion of the mixture. Prof. Hopkinson has built a number of engines utilizing this principle and it is stated that from 12 to 14 per cent. more horsepower is obtained, and that carbon is almost unknown. The consumption of water is 2.4 pounds a brake horsepower. The paper attracted considerable attention, and the subject is of interest to the designer and user, although it would appear after serious consideration that the plan of water injection involves complications. As the gaseous and physical conditions of the internal combustion engine are very similar in types of engines widely different in design, it will be necessary to make clear what it is that is required.

The energy in the fuel used in the ordinary motor car is obtained when a mixture of the gasoline and air is exploded or burned while under compression. Its temperature and, consequently, pressure rises in accordance with a definite law—more or less—depending on the practical working conditions. A large percentage of the fuel burned in this manner is lost; that is, it passes out to the atmosphere by means of the water jackets, radiator, etc., or, in other words, the heat units are not turned to useful work. In addition there is the factor of expense, also weight.

The average motorist does not consider the matter of cooling beyond maintaining the supply of water in the radiator and protecting the cooler in cold weather by the use of non-freezing solutions or covers, or both. The subject, however, is of importance, it being well known to engineers that an engine that is too cool results in inefficiency, as does a motor that is too hot. In view of the high cost of fuel the regulation of temperature is a subject that is receiving serious consideration.

To obtain almost ideal efficiency it is obvious-

ly necessary that the range or rise of explosion pressure should be as large as possible, so that losses may be reduced to a minimum in the ordinary engine, where the compression is constantly varying, due to the use of the throttle control. When the gaseous or semi-gaseous mass is ignited in the cylinder, the temperature rises to a maximum long before the piston has had time to move more than a very small proportion of its stroke. The cooler the mixture can be held without losing its form as a vapor, the larger will be the difference in temperature, and, similarly, the higher the independent temperature of the cylinder walls, the less will be the amount of heat wasted through them.

The explosion must be constrained in some way, and the faster the expansion is allowed to take place, the better will be the fuel efficiency, neglecting all else for the moment as remaining constant. It is obvious that the gas cannot be expanded until its pressure reaches that of atmospheric, because the pressure falls so fast that little work is done on the piston at the end of its stroke. It is largely for this reason that gearing is a necessity, and this is made very clear by an examination of an engine card or pressure diagram, which is frequently not unlike that at Fig. 1 in its main characteristics.

The removal of the heat by means of the water jacket is necessary to insure the maintenance of satisfactory lubrication; that is, to reduce friction losses. Air-cooled engines, if small, are perfectly satisfactory, running without trouble at twice the temperature of those water-cooled, and in sizes where the heat can be radiated fast enough to maintain lubrication and to prevent

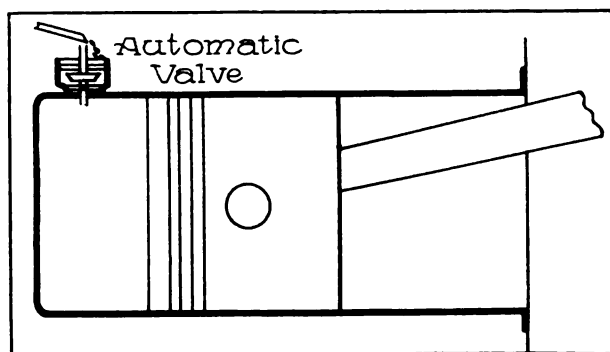


Fig. 2—Water Injection in Large Oil and Gas Engines.

attenuation of the incoming charge by raising its temperature before explosion, efficiency would be reduced by water cooling. Over-cooled engines



are not uncommon nor were over-heated motors unknown several years ago.

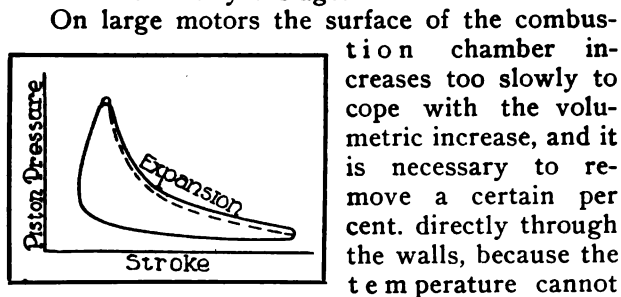


Fig. 3—Dotted Line Indicates Jacket Cooling; Full Line, Internal Water Cooling.

On large motors the surface of the combustion chamber increases too slowly to cope with the volumetric increase, and it is necessary to remove a certain per cent. directly through the walls, because the temperature cannot be controlled. It may be either relatively too cold or too hot, and in spite of the great reduction in cylinder wall thicknesses now possible, it is necessary to keep the jacket water at a low temperature, not only to avoid evaporation, but to insure sufficient actual flow of heat from places where thickening occurs in the casting.

It seems fairly obvious that an attempt should be made in some way to utilize all this jacket heat in the motor, and, although this point was considered in the earliest days of the gas engine, it has never been given serious consideration for use on the automobile. Gaseous explosions, to be effective if all the charge be burnt at once, must be rapid, so much so that if the gases in an engine were not disturbed or turbulent, then explosion would not be fast enough to enable the power stroke to be completed in time. On account of this whirling, which brings the burning flame in contact with many places on the walls, the greater part of the heat given out to the cylinder itself is that absorbed during the existence of actual high temperature flame.

The existence of this rapid "knocking" explosion very naturally led to means by which it could be smoothed out and its pressure spread over a greater portion of the stroke. With this object in view, and also to obtain cooling to prevent warping and preignition, it has been the practise in large oil and gas engines to admit water or water dust and steam during the inlet stroke as indicated at Fig. 2, for cooling is a matter of great difficulty in large cylinders and necessitates constant running below maximum output and the use of separately cooled pistons and valves.

The report of Dr. Low of England, who has experimented with cooling engines by the injection of water, is of interest, and he states that cooling the gases behind the moving piston is not quite what is wanted to cool the engine. The cooling of these gases depends on the amount

of disassociation at combustion, the varying specific heat of the gases and water vapor injected or contained in the fuel, and many other causes, so that it is found to be really most effective to work on low temperature bases often impossible when high compression is needed to secure compactness of design.

In his report Dr. Low states:

It is wrong to cool only the burning gases by mixing steam with them, because in the evaporation of this water heat will be absorbed, doing work on the water only partially compensated for by any help due to its expansion pressure towards the end of the stroke. Preignition may be avoided, but there is another method which has been brought into prominence largely by the experiments of Prof. Hopkinson. Some years ago the writer was also much taken with the idea of an alternate steam and gas engine, an engine with a steam or red hot sided piston, or the use of water and fuel immediately together in a semi-flash boiler, and it is on these lines there is room for development.

The heat given to the engine walls is wasted. Why not absorb this heat by water, not using enough to allow it to give trouble as a liquid, but using the hot running gasoline engine to vaporize the water, keep the engine cool, and provide steam to raise the pressure of the expansion line without the presence of water existing as water and not steam, appreciably reducing the explosion temperature at a time when the heat is most rapidly being given to the cylinder walls.

An advantage could be obtained by cooling by water internally injected. It is quite clear that the water must be admitted so that it will not be evaporated by the flame, but by the walls, and it must, therefore, reach them as a liquid; it must not remain as a liquid, and must be controlled either by load or even by throttle opening or temperature or pressure regulation; it is, therefore, simple to direct it onto parts liable to warping, such as valves, or upon the parts exposed to intense heat in high pressure engines. The writer has made numerous experiments in this connection, especially, and as there would seem to be a feeling that the high pressure engine without the usual atmospheric or alleged carburetor will become not uncommon in the future on account of its efficiency and transmission effectiveness, it is instructive to remember that fuel and water may be injected together, partly disassociating the latter, reducing the engine temperature to such purpose that no water jacket is needed, even if not vapor cooled and whether the steam is condensed after or not, so raising the expansion averages that it would lead one to think that the gas turbine may resolve itself into a gasoline vapor and steam expansion turbine, both pressures being obtained from waste heat.

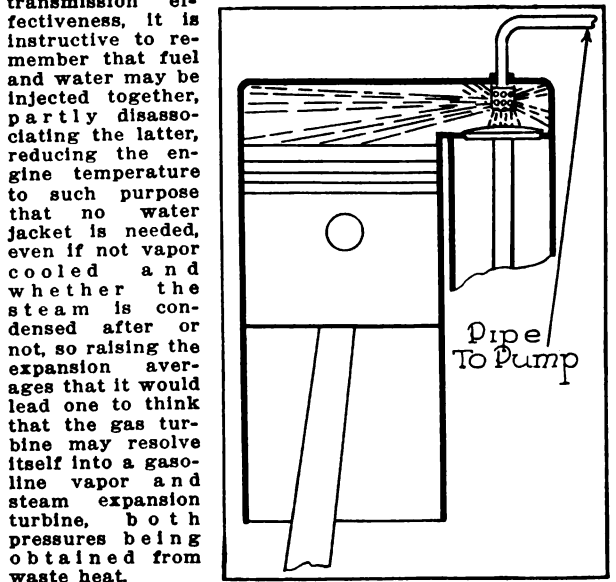


Fig. 4—Elementary Form of Water Injection.

It might even be possible to recover some of the water, especially in conjunction with a turbine engine, but we must remember that small volume cylinders must be kept usually at a lower temperature than that necessary for the highest efficiency; again, there seems reason to



suppose that the atmospheric engine may be superseded by a high compression type, doing away with the somewhat humorous carburetor, and in this case, although internal cooling would be very valuable, we might further help by the cooling effect of gasoline. It is, however, no use injecting the fuel or water direct into the cylinder, and if the fuel were to be injected in contact with the cylinder walls it would lead to burning and over-heating of the piston and cylinder without any corresponding rise in efficiency, owing to the fact that nearly all of the effective heat would be carried away through the metal.

Water injection to gasoline engines, where employed on motor cars, is a very different matter from its use on large gas engines. It sounds very nice to be able to cool a carboned piston and cylinder so well that incandescence, and consequent preignition, are avoided, but this is not to be done by sucking in a few drops of water. It means the use of a pump, and, although this might be pressure operated from exhaust or vapor jacket if in use, it is not a simple matter to design a distributing pump and pipework.

The alternate is to use the valves to admit water, but it must be properly sprayed in and spread, and if this means the use of a pump or valve on each cylinder, it will be as bad as a return to the low-tension ignition, as far as complication is concerned. On a large engine, where we have thick cylinders, the prevention of high spots is imperative for safety, but the success of injection cooling on light car engines is another matter. We have thin, easily warped cylinders, a mixture to keep cool which cannot properly be done by air outside or inside the cooling water, and a valve gear to keep accurately adjusted and unaffected by excessive expansion in the interests of silence.

Small, high speed engines can afford to sacrifice some cooling efficiency, and high speed pumps are not easy to keep in order; all this must be balanced up. To have a jacketless engine, much lighter, no freezing, no radiator, and no pumps, and an engine that will not knock easily is very attractive; it is quite possible and even probable that the injection engine will have its day, and, if not on the road, the aeroplane would give it a good outlet. Water is easily obtained, and not much is required in proportion to the weights of fuel and oil carried in the ordinary way. The subject is of undeniable interest to the designer and user alike. Fig. 4 shows the absolute simplicity of the proposition in its elementary form.

## AMERICAN ROAD CONGRESS.

### Everything in Readiness for the Big Meeting in Detroit.

Over 200,000 invitations have been issued throughout the United States and Canada to those interested in the third annual American road congress, to be held in Detroit, Sept. 29-Oct. 4. Early estimates of the probable attendance have been revised time and again. Arrangements are completed for handling one of the biggest crowds in the history of the American Highway Association, under whose auspices the event is to be held.

The list of speakers already has been announced in these columns and the features of the programme are such as are expected to interest all students of the problem of good roads and how to secure them. Perhaps the greatest interest, at this time, is felt in the election of officers for the ensuing year. The appointment of Thomas Nelson Page as ambassador to Italy will make it necessary to select a new chairman of the membership committee. The present officials are:

President, Logan Waller Page, director, United States office of public roads; vice president, W. W. Finley, president, Southern Railway Company; secretary, J. E. Pennybacker, Jr.; treasurer, Lee McClung; field secretary, Charles P. Light; chairman, board of directors, James S. Harlan, member, Interstate Commerce Commission.

## TESTING COLE SIX.

### New Model Being Subjected to Strenuous Work on the Pacific Coast.

According to reports received at the factory from C. S. Crawford, chief engineer of the Cole Motor Car Company, Indianapolis, the Cole transcontinental test car has been undergoing some strenuous work for the past several weeks. Crawford and his party, which includes H. C. Bradford, advertising manager, and Lew Pettijohn, chief tester, have been running the machine through very sandy and mountainous country in Oregon, Washington and British Columbia. More than 6500 miles have been covered, the last 3000 being over the northwest, including the desert land of eastern Oregon and twice over the Cascade mountains.

On the trip to Spokane the John Day grade, seven miles in length and conceded to be one of the steepest hills in the world, afforded an excellent opportunity to test the climbing ability of the new machine, as well as the brakes. It is said that the greater part of the ascent was made on the intermediate gear, and that in all tests the motor kept cool and the brakes worked perfectly. The return trip will be made over the northwest trail. The tour to the Pacific Coast was over the central transcontinental route.

R. S. Wiltrout, formerly manager of correspondence at the executive offices of the Stewart-Warner Speedometer Corporation, Chicago, is now connected with the John W. Blackledge Manufacturing Company, Chicago, maker of the Velvet shock absorbing springs, in the capacity of sales manager.

An address on the subject of good roads by O. L. Williams of Bowie, Texas, at Mexia, Texas, the lecture pertaining to highways from Colorado to the Gulf, resulted in the formation of a good roads organization. The following officers were elected: President, R. J. Jackson; vice president, T. B. Poindexter; secretary-treasurer, J. M. Blake. The organization will become affiliated with the state and national bodies.



## GENERAL NEWS OF THE INDUSTRY.

**Is the Standard Oil Company to Engage in the Manufacture of Automobiles?—Production of Alco Trucks May Be Revived—Demise of George W. Bennett.**

**W**HETHER or not the Standard Oil Company is to enter the industry as a producer of automobiles has been a subject of concern among manufacturers and owners for some little time. Earlier in the month, various newspapers throughout the country chronicled the organization of the Rockefeller Motor Company in Cleveland, O. The concern was said to have been incorporated with nominal capital, the incorporators being Sterling Newell, F. S. Whitcomb, R. F. Denison, Ellis R. Diehm and Thomas F. Fay. With the exception of Fay, these were understood to be members of a law firm closely connected with Standard Oil interests. Fay was formerly editor of a large automobile trade publication.

According to the original dispatch, this concern was to take over the Goby Engine Company of Cleveland, a company recently formed to produce the Goby single sliding sleeve engine, and also to produce a kerosene burning engine. It was further intimated that cars ranging in price from \$350 to \$1000 would be produced, these to be capable of averaging 50 miles on a gallon of kerosene or gasoline.

Letters addressed to the Rockefeller Motor Company and the Goby Engine Company have failed to elicit information. But a subsequent Cleveland dispatch denies certain portions of the original story. It is now maintained that the attorneys interested in the Rockefeller company are in no way connected with John D. Rockefeller or the Standard Oil Company. The name is said to have been chosen from the fact that the company will occupy offices in the Rockefeller building.

Despite the denials, the Wall Street Journal says it will not be surprising to see interests allied with the Standard Oil Company eventually become identified in a large way with the manufacture of automobiles. In a dispatch from Boston, this organ publishes the following:

Men connected with Standard Oil are understood to have made an effort several months ago to get control of the Ford Motor Company, the country's largest motor car producer, but Henry Ford, its chief owner, is said to have refused to sell at any price. Within a few weeks Standard Oil money has been picking up the common stock of one of the four largest automobile companies in the country with a production of about 35,000 cars per annum. It is too early yet to say whether a controlling interest is what the Standard capitalists are after. It is also understood that Standard Oil money has made some

headway in buying into another automobile enterprise.

The reason for Standard Oil's interest in automobiles is believed to lie in the huge surplus stocks of kerosene stored at various points throughout the world. The Rockefeller Motor Company, supposedly formed by the oil people, has practically admitted that its primary purpose is to build an engine that will burn kerosene instead of gasoline. If this attempt proves successful, the automobile industry will be revolutionized and Standard Oil will receive general approval for having furnished a cheap fuel for the most popular means of transportation the world has yet discovered.

### MERCER SALES MANAGER.

**Almy Assumes Responsibility for Distribution of Trenton Product.**

Walter A. Almy has been appointed sales manager for the Mercer Automobile Company, Trenton, N. J., maker of Mercer cars. The appointment is one which will meet with general approval on the part of his many friends throughout the industry, and because of his past experience the officials of the company feel that he is a valuable addition to the Mercer organization.

Previous to his connection with the manufacturing end of the industry with this concern, Mr. Almy devoted several years to the retail sale of Cadillac cars in White Plains, N. Y., and later at Trenton, N. J. Naturally, this has had the effect of widening his acquaintance very materially and will be of decided value to him in his new position.

### DURYEA BUYS OUT BROOKS.

**Latter Concern Will Continue the Production of Boats and Furniture.**

The Duryea interests connected with the Duryea Motor Company, Saginaw, Mich. (Charles E. Duryea), have purchased of the Brooks Manufacturing Company of that city the business of its entire motor vehicle department. The Brooks concern will continue the production of boats and furniture. The purchase represents an investment of more than \$100,000.

The Duryea Motor Company has been engaged for some time in the manufacture of solid tire motor buggies, incorporating the Duryea system of cooling, roller drive and other exclusive features. The Brooks company produced light weight delivery wagons under license from



Charles E. Duryea, these incorporating many of the same features. Steps will be taken to establish both lines in separate factories, but under practically the same management.

### NATIONAL IN CHICAGO.

#### Tennant Motor, Ltd., to Handle Product for State of Illinois.

The National Motor Vehicle Company, Indianapolis, Ind., maker of National cars, has closed a deal with Tennant Motor, Ltd., of Chicago, under the terms of which this concern becomes distributor for this line throughout practically the whole State of Illinois. The company is located at 2447 Michigan avenue, where it has

handled the Simplex line for some time. However, it has an option on a Michigan avenue corner property where it expects to build during the coming winter, so as to have larger quarters in which to take care of its spring business.

J. G. Tennant, treasurer of the concern, is the active controlling factor

**J. G. Tennant, Treasurer, Tennant Motor, Ltd.**

in the organization, particularly since W. G. Tennant retired to become vice president of the Stewart-Warner Speedometer Corporation. His ability as an automobile salesman has been such as to justify the prediction that the National business in Chicago and Illinois has been placed in safe hands. The concern will continue to represent the Simplex.

### CONCERNING ALCO TRUCKS.

#### Anticipated That New Company May Be Organized to Continue Production.

While nothing definite has been made public as yet, it is understood that a number of men in

Providence, R. I., some of whom were identified with the American Locomotive Company in the production of Alco trucks, are considering the advisability of organizing a new company to continue this line. It will be remembered that Aug. 13 the directors of the American Locomotive Company announced its complete withdrawal from the field of production, with respect both to pleasure and commercial cars.

William H. Draper and Michael W. Norton, both of Providence, have contracted with the American Locomotive Company for some 30 Alco trucks, the transaction involving an expenditure of about \$100,000, it is stated. It does not appear that Mr. Draper is interested in the proposition to organize a new company, but Mr. Norton is said to be actively engaged in studying the situation. When asked to make a statement concerning the matter, he expressed a desire to wait until about the first of the month.

### DEMISE OF G. W. BENNETT.

#### Vice President of Willys-Overland Company a Victim of Appendicitis.

The automobile industry, as well as a large portion of the business world in America, was shocked to learn of the sudden death of George W. Bennett, vice president and general manager of the Willys-Overland Company, in Toledo, O., Sept. 19, after an operation for appendicitis. His rare executive ability was a big factor in the success of the plants known as the John N. Willys holdings, and he was prominent throughout the industry because of his insight into the business methods making for permanency.

Mr. Bennett came to this country from England when a young man. At first he was identified with the bicycle industry as sales manager for the Thomas B. Jeffery Company, and went into the automobile field with this firm. Later he became associated with the Knox Automobile Company, Springfield, Mass., and the White Company, Cleveland, O. Soon after John N. Willys purchased the business now bearing his name in Toledo he became vice president of the Willys-Overland Company, and his duties grew with the expansion of that concern, Mr. Willys being the controlling factor in several other companies, among which may be mentioned the Gramm Motor Truck Company and the Garford Company. He was particularly well known in the East and Middle West and his advice was much sought after in all matters affecting the automobile industry.



**COLEMAN GAS PRODUCER.****New Company Would Transform Coal into Fuel for Automobile Use.**

The Coleman Gas Producer Company, capitalized at \$1,000,000, has secured a Delaware charter and proposes to place the Coleman gas producer on the market. The device is the invention of Clyde J. Coleman, and is said to be intended to take the place of the fuel tank of the present gasoline system on automobiles. Half of the space is to be occupied by the fuel reservoir, and the remainder by a special producer of special construction, operating, it is declared, on the principle of the "present stationary gas producer". Coal screenings, charcoal, crude oil or any other low cost carbonaceous material will be employed as fuel, it is explained.

Among those associated with Mr. Coleman in the enterprise are the following: President, H. H. Thomas of Thomas & Co., a Chicago stock and bond house; vice president, John Splitdorf; treasurer, P. J. W. Kelly; secretary, John Kane Mills, and Owen H. Fay of the O. H. Fay Auto Livery Company, Chicago. A stock issue of \$450,000 has been authorized, this having been placed on the market at \$10 a share.

**TORRINGTON COMPANY'S REPORT.****Annual Statement Shows Disposition of Splitdorf Concern's Holdings.**

The Torrington Company, Torrington, Conn., which is in a sense a holding company for the Excelsior Needle Company and the Standard Company of Torrington, the National Needle Company, Springfield, Mass., the Splitdorf Electrical Company, Newark, N. J., and other companies in this country and abroad, has made public its annual report for the fiscal year ending Aug. 31, 1913. In connection therewith President John F. Alvord makes a statement which will prove of interest to the automobile industry.

It will be remembered that the Torrington Company purchased the stock of C. F. Splitdorf, Inc., of New York City, something like a year ago, soon after which the latter concern was reorganized as the Splitdorf Electrical Company, and its headquarters removed to Newark, N. J. Concerning this movement, Mr. Alvord's statement is as follows:

The Splitdorf Electrical Company has been moved to Newark, N. J., with the exception of the spark plug business and the ball bearing business. The Standard Company has purchased the spark plug business of the Split-

dorf company, and the Excelsior Needle Company has purchased the ball bearing business. We are unable to make a report as to the earnings of the Splitdorf company, but feel very sure that we are making some profit and are getting the business into better shape. We believe that the Splitdorf company will eventually be one of our very profitable subsidiaries.

He states further that the business of the two needle companies mentioned has increased both in volume and profit, while the Standard Company has done increased business with largely increased profit. The annual report shows the following:

| <b>Receipts.</b>                 |                  |                    |                  |
|----------------------------------|------------------|--------------------|------------------|
|                                  | 1913             | 1912               | 1911             |
| Dividends .....                  | \$352,847        | \$360,285          | \$237,518        |
| Rent .....                       | 110,000          | 110,000            | 110,000          |
| Subsidiary loans.....            | 145,000          | .....              | .....            |
| Accounts receivable.....         | 15,867           | .....              | .....            |
| Sale new stock.....              | .....            | 1,021,600          | .....            |
| Miscellaneous .....              | 32,152           | 24,922             | 4,848            |
| <b>Totals.....</b>               | <b>\$655,869</b> | <b>\$1,516,207</b> | <b>\$352,366</b> |
| <b>Expenditures.</b>             |                  |                    |                  |
|                                  | 1913             | 1912               | 1911             |
| Dividends and interest....       | \$400,000        | \$348,000          | \$288,000        |
| Salary and fees.....             | 31,855           | 31,397             | 5,947            |
| Bonds purchased.....             | 91,985           | 140,000            | .....            |
| Stock Splitdorf.....             | .....            | 750,000            | .....            |
| Loans subsidiary companies ..... | 100,000          | 101,525            | .....            |
| Miscellaneous .....              | 13,028           | 30,484             | 56,527           |
| <b>Totals.....</b>               | <b>\$636,868</b> | <b>\$1,401,406</b> | <b>\$350,474</b> |

The cash balance on hand Aug. 31, 1913, was \$285,740. The company has purchased during the year \$92,000 of its own bonds, which are held in the treasury of the company.

**HAZARD MOTOR PLANT.****Additions Will Enable the Company to Produce 5000 Engines a Year.**

At present the Hazard Motor Manufacturing Company, Rochester, N. Y., maker of Hazard power plants, is compelled to run several of its departments 20 hours a day in an effort to keep up with orders. To obviate this and to prepare for future expansion, the company is increasing its manufacturing facilities by the erection of a new building, 60 by 130 feet, and by the purchase of additional machine tools.

One part of the new building will be used for block testing, its area being double that of the present test room space. The balance of the structure will be used for stock and shipping rooms. The space in the present factory previously used for testing and storage of stock will be utilized for production purposes, increasing the same in both the assembly and machine departments over 30 per cent. It is anticipated that these various changes will enable the Hazard company to build a maximum number of 5000 motors a year.



### INCREASES CAPITAL STOCK.

#### Ray Harroun Company to Erect Its Own Kerosene Carburetor Factory.

The Ray Harroun Company, Indianapolis, Ind., maker of the Harroun kerosene carburetor, which is offered this year as optional equipment on Henderson cars, has filed a notice of increase in capital stock from \$50,000 to \$600,000, with the secretary of state in Indiana. The increase is needed, according to the statement of the company, in order that it may own its own plant.

It is announced that the company plans to erect a factory costing approximately \$200,000, although the exact site has not yet been determined. The present plant on 10th street, already has proven inadequate, orders for 200,000 kerosene carburetors having been received, according to officials of the concern.

The present stockholders include the following: Ray Harroun, well known as a racing driver; L. D. Woods, president of the Pension Mutual Life Insurance Company, Pittsburg; R. H. Allen, president of the Eastern Dispensing Company, Pittsburg; H. B. Wilcox, president of the W. W. Wilcox Company, Chicago, and D. M. Bell of the Ward-Bell Company, Chicago.

### GROUT PLANT SOLD.

#### Said to Be the First Erected in America for Automobile Production.

The plant of the Grout Automobile Company, Orange, Mass., claimed to include the first building erected in America to be devoted exclusively to the production of motor vehicles, was sold early in the month at receiver's sale. The company as such passes out of existence, but Arthur Kirkpatrick, for some years sales manager of the concern, purchased the stock of parts, chassis, etc., and one of the smaller buildings, which has been used as an automobile barn, or storehouse. Mr. Kirkpatrick announces that he is in a position to supply spare parts for Grout cars and will conduct a general repair business in this location.

The real estate, two large factory buildings with machinery, an adjoining shed and a two-story house, were purchased by the Orange National Bank, the price being \$19,010, to which must be added a mortgage and accrued interest amounting to \$3000. F. A. Dexter, president of the bank, states that the property will be sold to a new concern which desires a location in Orange

—not a motor car company. Nine motor cars, some new and some second hand, were sold to different individuals for which the receiver realized a total of \$3500.

### SEEK SOUTH AMERICAN TRADE.

#### Chicago Association of Commerce Opens Office in Buenos Aires.

Believing that American manufacturers have permitted business in South America to be taken up by European concerns largely because little effort has been made to establish the proper connections in Latin America, the Chicago Association of Commerce has opened what it terms a trade embassy in Buenos Aires, Argentina. This embassy, which is really a branch office of the Chicago organization, has opened a permanent exposition in which goods produced in Chicago are to be on exhibition.

F. C. Enright, who has been studying business and trade conditions in South America since 1909, has been appointed manager. Through personal association with retail merchants and wholesale distributors in several of the Latin American republics, Mr. Enright has succeeded in awakening an interest in American made goods. The exposition starts with exhibits from 50 Chicago factories, the line ranging from automobiles to tar soaps.

### NEW CAR FROM PENNSYLVANIA.

#### Standard Steel Car Company Experimenting at Its Plant in Butler.

The rumor that the Standard Steel Car Company, Butler, Penn., maker of railroad coaches, was about to engage in the automobile industry, has received what may be regarded as partial confirmation. Work has been progressing for some time on a new factory on a site of about 10 acres formerly used for a lead mill, and the company verifies the statement that these buildings are intended for automobile construction.

The work may be said to be in an experimental stage at present, and the officials of the company decline to make any further statement regarding their plans. It is pointed out, however, that in case of a favorable decision there is much machinery in the railroad car plant which could doubtless be used to advantage in the construction of automobiles.



## NEW AND NOVEL ACCESSORIES THAT APPEAL TO MOTORISTS

**Boyce Motometer Junior.**

To obtain maximum efficiency from the motor the cooling water should not be allowed to boil, it being held that the best results are obtained when it attains a temperature of about 170 degrees Fahrenheit. When the motor overheats through a lack of water or oil, because of too rich a mixture, defective pump, etc., a loss of power follows and unless the trouble be remedied a large repair bill is likely to result. These conditions are not noted as a rule, until the car is stopped and an examination is made. The Motometer Company, Inc., 1790 Broadway, New York City, is marketing a Junior model of the Boyce Motometer, which is a neat, compact device for attachment to the radiator cap. It is fitted with a protected glass tube containing a red fluid which is actuated by the temperature of the water in the radiator. The dial of the Motometer is calibrated in degrees and lettered to denote the results obtained from varying temperatures, these including the maximum and minimum points, steaming and freezing, respectively. A small opening in the face of the dial permits of reading the device at night when the headlights are burning, as the red column is easily visible against the white back-

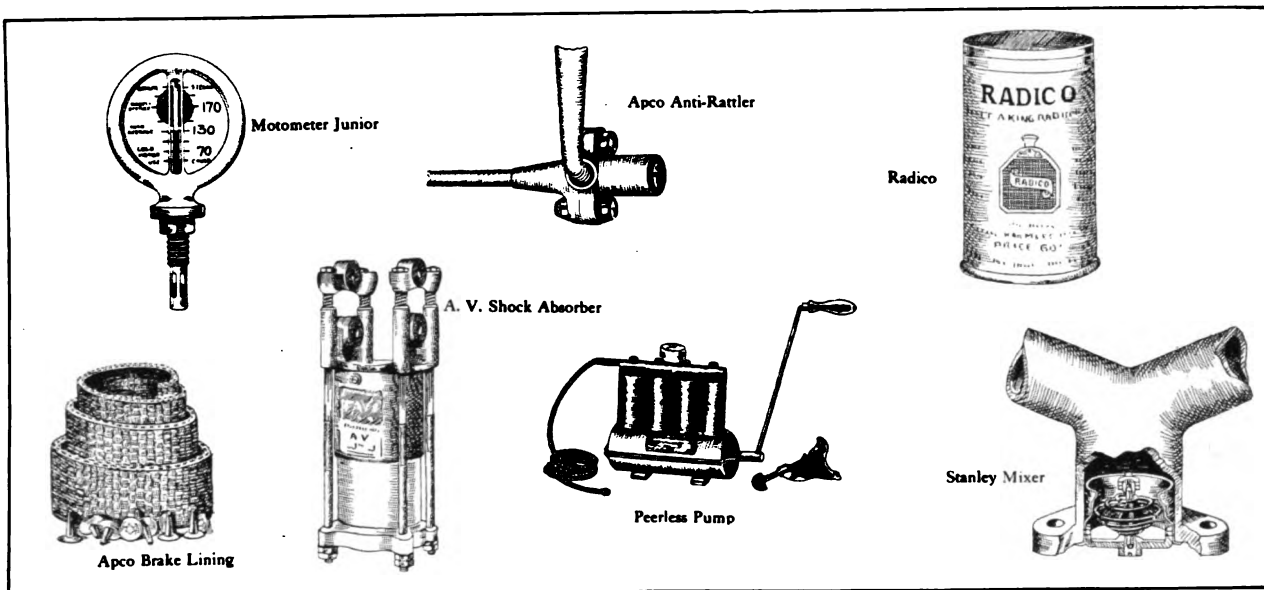
ticles of the material affect the efficiency of the flywheel generator. The Apco lining is of special construction; comes in lengths to fit the brake drum and rivets are supplied with each length.

**Radico.**

Radico is a chemical preparation for repairing leaks in the radiator, and it is claimed by the maker, the Radico Manufacturing Company, Springfield, Mass., that the compound contains no acids or injurious minerals which would eventually corrode the metal and cause other leaks. It is also stated that a damaged cooler can be repaired in 15 minutes. The compound comes in a compact can and can be easily stored in the tool box.

**A. V. Shock Absorber.**

The A. V. shock absorber, marketed by the Hudson Export & Import Company, 140 West 42nd street, New York City, is an imported design operating on the hydro-pneumatic principle. A hydraulic device is utilized for the purpose of putting a load on the springs in order to prevent any bouncing effect, but this load comes into operation when the spring is compressed, not on the recoil. There are two springs, one taking the normal load,



ground of the light. The Motometer is adapted to any type of radiator cap; comes finished in nickel or polished brass, and is moderately priced. Complete details of the device are set forth in a booklet which will be mailed on request.

**Apco Anti-Rattler No. 3.**

The Auto Parts Company, Providence, R. I., announces a new Apco device termed the Anti-Rattler No. 3. It is one of the most practical accessories for model T Ford cars brought out by this concern, as by it play in the ball end of the steering arm and connections is eliminated and it is possible to make adjustments from time to time as needed. It replaces the usual steel cap on both ends of the steering gear connecting rod, which, when adjusted by filing the halves of the ball socket, usually result in the part binding when the wheels are turned. This is due to the difference between the worn, flat and round part of the ball. The Apco device consists of a bronze shell adjusted by means of a screw plug in the base, and with it, it is possible to eliminate all play. The shell member also contains a spring which holds a steel stud in contact with the ball, resulting in a cushioning effect, and thus in easier steering. The new device is inexpensive. The company has also brought out a new brake lining for the service brake, a material in which all metal is eliminated. It is held by the Ford engineers that the use of a friction material containing any metal is largely responsible for magneto troubles, in that par-

the second, which is not as long, coming into operation when the load becomes greater. The hydraulic device consists of a centrally situated cylinder in which works a small piston connected to the crosshead. Smaller holes are bored at intervals through the walls of this cylinder and through these castor oil is forced on the down-stroke of the plunger. At the end of the down-stroke the level of the liquid rises above the top of the open ended cylinder, and the expansion of the springs, therefore, causes this oil to pass into the cylinder again, both through the small holes in the wall and also past the cup lever. The case containing the springs and forming the extension of the part upon which they rest at the base slides between the inner and outer tubes and thereby prevents any ingress of foreign elements to the working mechanism. An adjusting block is placed at the bottom, which allows the spring pad to be raised so as to place more pressure on the springs. The guides of the four slide bars are externally situated. A special form is made for use with the front springs, operating on the same principle, but the parts are arranged to replace the spring shackle in compression.

**Peerless Pump.**

The Peerless four-cylinder pump, produced by the Peerless Accessories Manufacturers, 1926 Wabash avenue, Chicago, is a small, compact unit, operated by a crank and designed to be clamped to the running board of the car. It requires but little effort to operate and it is



stated that a large sized tire can be inflated to the maximum pressure in a very short time. Each equipment includes a clamp, suitable length of hose and a gauge. The hose connection automatically opens and closes the valve in the tire. The pump comes finished in black enamel with nickel trimmings. It weighs nine pounds.

#### Stanley Mixer.

The Stanley mixer, manufactured by W. P. Deppe, 127 Duane street, New York City, is a mechanical device designed to be installed in the intake pipe between the carburetor and the cylinders. It comprises a series of spirals and flanges, the construction being rotated by the incoming mixture, an action resulting in breaking up any particles of fuel not atomized by the carburetor. This results in efficiency and economy in that the liquid is converted into a useful vapor and less gasoline is required. It is also stated that acceleration is greatly improved.

#### Stewart Patch Outfit.

One of the principal causes for failure of patches to adhere to the inner tube is a lack of pressure after applying. A handy addition to the tool kit or garage is the Stewart patch outfit, marketed by Chas. E. Miller, 97-103 Reade street, New York City. The equipment includes a lightning grip clamp, which exerts a powerful pressure over the entire patch. It is the size of an ordinary pair

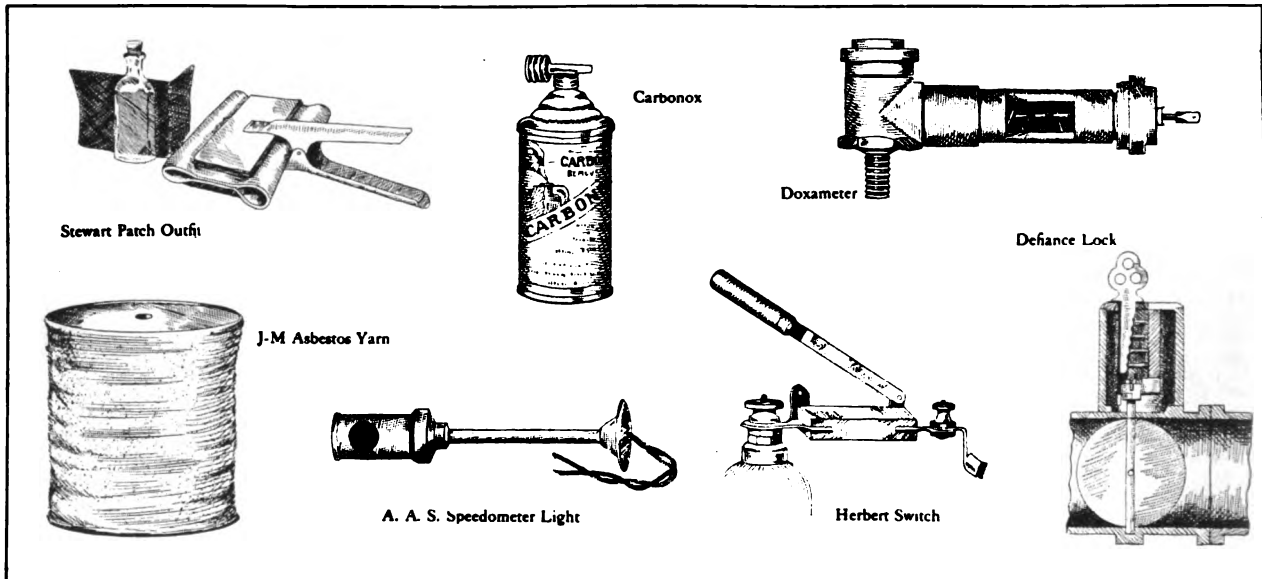
types of devices fitted to the intake manifold of a motor in that it is controlled by the accelerator. It is claimed that by its use not only is the supply of fuel controlled, but a considerable saving is effected as well. It facilitates combustion in that complete vaporization of the gasoline is made possible. A plunger member, controlling the amount of air, is connected to the accelerator mechanism.

#### J-M Asbestos Yarn.

The H. W. Johns-Manville Company, New York City, is marketing the J-M asbestos yarn, which is wound especially for packing spark plugs, although it may be utilized for a number of other purposes and where a heat proof packing is required. It is a pure, two-ply yarn, each strand containing a fine brass wire, and the construction is unusually rugged. Its diameter is but .0625 inch and the yarn comes in spools, convenient for use. It is inexpensive.

#### A. A. S. Speedometer Light.

An inexpensive, yet high grade speedometer, clock or gauge light is being marketed by the American Auto Supply Company, 1741 Broadway, New York City, and 1410 South Michigan avenue, Chicago. It is small, neat and compact and comes complete for fitting to the dash. It is finished in brass or nickel and may be obtained with or without the bulb. A two candlepower lamp is utilized



of pliers and the entire outfit weighs but eight ounces. The clamp may be utilized for a hand vise and it is stated that it will retain securely anything up to 1.5 inches. To put on a patch it is not necessary to entirely remove the tube—just enough to get at the puncture, apply a patch and press it with the clamp. The outfit comes packed in a neat box.

#### Carbonox.

Carbonox is a chemical carbon remover manufactured by the Northwestern Chemical Company, Marietta, O., and it is stated that it does not dissolve the carbon, but attacks the charred oil that secures the flakes of carbon to each other and to the metal. By destroying this it is possible to blow out the deposits with the exhaust. To use, about half a pint is divided evenly among the cylinders by pouring it through the spark plug openings, and turning over the motor several times. It is allowed to stand for about 15 minutes, after which the engine is started. The solution comes in cans and it is stated that each contains enough material to keep a four-cylinder motor free from carbon for six months. A detachable spout is supplied with each container, and Carbonox may be injected into the cylinders much in the same manner as with an oil can, by exerting pressure on the bottom of the can.

#### Doxameter.

The Doxameter is manufactured by the Doxameter Company, Chicago, Ill., and differs from the conventional

with the device. The American Auto Supply Company is issuing a new catalogue, which will be mailed free on request.

#### Herbert Trouble Finding Switch.

The usual method of locating a missing cylinder is to short circuit the spark plug by either detaching the cable or utilizing a screw driver. Edgar Herbert, Broadway and 195th street, New York City, is manufacturing an ingenious switch which comes singly or in sets of four. It is a form of knife throw switch, the operating lever being insulated and employed to break the secondary circuit. Provision is made for attaching the secondary wire, a terminal being fitted to the part carrying the lever. The device is also designed to test the current from the source of supply as by engaging and disengaging the lever, the intensity of the spark may be noted. It could be employed to lock the ignition by leaving the lever disengaged when the car is left unattended. The Herbert switch is inexpensive.

#### Defiance Lock.

The Defiance lock is manufactured by the Defiance Manifold Lock Company, San Francisco, Cal., and as the name implies is a device for locking the intake pipe and preventing passage of the mixture to the cylinders. It is a controllable cut-off valve installed in the intake manifold and having a locking arrangement actuated by a removable key. It may be fitted to any make of car and is constructed in three sizes.



**Polo Pneumatic Tire Alarm.**

The importance of keeping the tires inflated to the proper pressure is well understood by the experienced motorist, but in the event of a small leak on the road the loss of air is not noticed until the car is stopped. The Polo Pneumatic Alarm Manufacturing Company, Clear Lake, S. D., is marketing a unique device termed the Polo pneumatic tire alarm, which comes in sets of four and is designed for attachment to the usual valve stem. When the pressure falls below a given point the alarm is sounded automatically, calling the attention of the driver to the shoe. The signal is said to be shrill and easily noted above the noises of the machine. The device is bored from solid brass, is very small and does not attract from the appearance of the car.

**Pierce Speed Controller.**

A form of governor, but differing from conventional practise in that it can be set for different speeds and locked, the owner retaining the key, is the Pierce speed controller, manufactured by the Pierce Speed Controller Company, Anderson, Ind. It is mounted between the carburetor and the intake manifold and regulates the supply of fuel by means of a butterfly valve. The last named component may be so set as to limit the vehicle speed as desired, a dial being incorporated for adjusting the mechanism and fitted with a lock. The device does

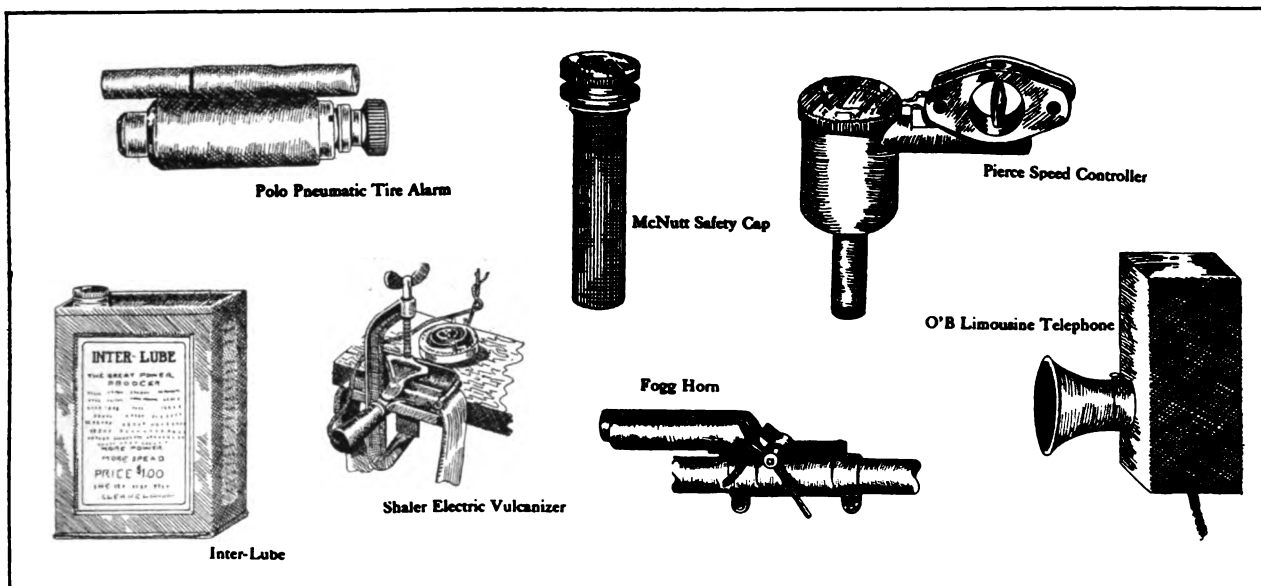
said to be sufficient for 50 gallons of gasoline, increasing the normal cost of the fuel about two cents a gallon.

**McNutt Safety Cap.**

The McNutt Can Company, 352 Pearl street, New York City, maker of non-explosive cans and tank devices for handling and storing explosive liquids, is manufacturing the McNutt safety cap, which is a device adapted to fuel tanks on motor cars. It is in the form of a screw cap and incorporated in it is a check valve, preventing vapors from leaving the container, but permitting ingress of air as required to break the vacuum where a gravity system is employed. This check valve prevents evaporation of the fuel, as well as eliminating danger of explosion through fire. The valve member has a fusible disc which gives vent to the internal pressure when the container is subjected to fire, thereby preventing an explosion. It is stated that considerable economy is made possible through the use of the device, which is moderately priced.

**Shaler Electric Vulcanizer.**

The C. A. Shaler Company, Waupun, Wis., is marketing a portable type of electric vulcanizer designed for service in the private or public garage, which may be operated on the lighting current, the outfit being constructed for direct or alternating currents and of different voltages. Plates are included for casings and tubes and a large variety of work may be performed with the



not affect the speed of the engine until the set speed is exceeded. All parts are enclosed, so as to be dust, water and tamper proof. The price varies according to the finish.

**O'Brien Limousine Telephone.**

The Joseph F. O'Brien Manufacturing Company, 61 Park Place, New York City, is marketing a new limousine telephone which differs from usual construction in that a reply can be received from the chauffeur. The design of the receiver employed by the driver is made so as to be loud speaking in order that instructions may be heard in noisy traffic. The inside instrument comprises a receiver and transmitter in a unit, and a button is also incorporated for signalling the chauffeur. The system may be operated by dry cells or a storage battery and the instruments are very neat and compact, that utilized by the passenger being fitted with suitable length of flexible cord, retainer, etc.

**Inter-Lube.**

The Inter-Lube Chemical Company, 915 Schofield building, Cleveland, O., is marketing a liquid preparation called Inter-Lube, which is mixed with the gasoline in the proportions of one teacupful to five gallons of fuel. It is stated that it will mix freely with the fuel without stirring, and is free from injurious chemicals and sediment. Several claims are made for the compound, among which are: Increase of mileage, more power, less lubricant required, no carbon and easier starting. A can is

equipment. The temperature is regulated by a rheostat, making the vulcanizer adaptable to all kinds of repairs, and the regulating device can be located away from the work bench, where it cannot be injured through accident. The company manufactures a wide variety of vulcanizing outfits and issues a booklet on the work, which will be mailed on request.

**Fogg Horn.**

The Motor Specialties Company, Cooper Lane, Waltham, Mass., is manufacturing a special exhaust operated horn designed especially for model T Ford cars, although it may be fitted to other types. It is a compact, well designed signalling device, simple in construction and being installed between the motor and the muffler its efficiency is not impaired by a leaky muffler. The signal proper is so arranged that the sound is thrown forward, insuring a volume of tone, even with the motor operating slowly. There are few moving parts, and no opportunity for back pressure or for clogging. It can be so installed that it does not interfere with the use of the usual cut-out.

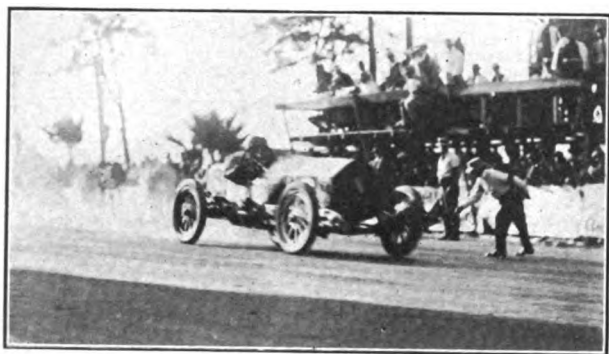
**Prest-o-Ceal.**

Prest-o-Ceal is the product of the American Manufacturing & Distributing Company, Louisville, Ky., and is a thin paste holding in suspension the exact proportions of mineral solids and a fibre that will harden quickly. Enough of the liquid is injected into the inner tube to form a thin layer, and the material is spread evenly by the motion of the wheel.



# WORLD'S RECORD FOR COOPER'S STUTZ.

WITH a new world's class record of 75.03 miles an hour to his credit, Earl Cooper won the 251.97-mile road race at Corona, Cal., Sept. 9, and then continued to the end of the 300-mile free-for-all event to finish a winner the second time the same day. Of course, he drove a Stutz, and these two victories made a total of five long distance events taken by this combination on the Pacific Coast this summer. The others were as follows: July 5, Potlach trophy, Tacoma, Wash., 220 miles; July 7, Montamarathon



Earl Cooper in a Stutz, Finishing a Winner in Free-for-All Event at Corona, Cal.

trophy, Tacoma, Wash., 250 miles; Aug. 9, road race, Santa Monica, Cal., 445 miles.

There is little satisfaction in considering what might have been, but it may be stated that the keen rivalry which has existed between the Stutz and Mercer drivers since the opening of the present racing season resulted in one of the most spirited contests of the year over the Corona course. Barney Oldfield was selected as the member of

the Mercer team to do battle against Earl Cooper and the Stutz. Oldfield has a record of past performances enjoyed by but few drivers in the world, but Cooper with his three previous big victories was a contestant worthy of the best that could be produced. Incidentally, it may be remarked that in the history of automobile racing there has been no driver to equal the performance of Cooper in taking three of the biggest, long distance, road races of the year. And Cooper was practically unknown a year ago.

But to return to the battle between Oldfield and the Mercer on the one hand and Cooper and the Stutz on the other. Oldfield took the lead on the first round and held it until the 14th, when he dropped one point. Thereafter he fluctuated between first, second and third until the 46th lap, when he seemed a certain winner. The Mercer lost its opportunity for winning the race in the 59th lap, when a nine-year-old lad, having wandered away from his mother's side in the excitement of the race, ran onto the course directly in front of the leader. Oldfield's pace at this point was estimated at close to 78 miles an hour. With that clear headed generalship for which Barney Oldfield long has been known, the steering wheel of the Mercer was turned abruptly. A front wheel was crumbled under the car and the mechanic was thrown against the curb. The driver and the boy were wholly unharmed. It is useless to speculate upon what might have been, but the boy's life was saved and at a splendid sacrifice.

There were three races on the card at the Corona meet. The first was for light cars, of 230

## POSITIONS OF THE LEADERS.

| Light Car Race.    |          |          |           |
|--------------------|----------|----------|-----------|
| Miles              | First    | Second   | Third     |
| 25                 | Goode    | Waterman | Schnack   |
| 50                 | Waterman | Rhodes   | Schnack   |
| 75                 | Waterman | Rhodes   | Schnack   |
| 100                | Waterman | Jackson  | Goode     |
| Heavy Car Race.    |          |          |           |
| 25                 | Oldfield | Cooper   | Wishart   |
| 50                 | Cooper   | Oldfield | Magone    |
| 75                 | Oldfield | Magone   | Cooper    |
| 100                | Oldfield | Magone   | Cooper    |
| 125                | Cooper   | Oldfield | Magone    |
| 150                | Oldfield | Cooper   | Magone    |
| 175                | Cooper   | Taylor   | Jeannette |
| 200                | Cooper   | Taylor   | Jeannette |
| 225                | Cooper   | Taylor   | Jeannette |
| 250                | Cooper   | Taylor   | Jeannette |
| Free-for-All Race. |          |          |           |
| 25                 | Oldfield | Tetzlaff | Cooper    |
| 50                 | Cooper   | Oldfield | Magone    |
| 75                 | Oldfield | Magone   | Cooper    |
| 100                | Oldfield | Magone   | Cooper    |
| 125                | Cooper   | Oldfield | Tetzlaff  |
| 150                | Oldfield | Cooper   | Tetzlaff  |

| Miles | First  | Second   | Third |
|-------|--------|----------|-------|
| 175   | Cooper | Tetzlaff | Hill  |
| 200   | Cooper | Tetzlaff | Hill  |
| 225   | Cooper | Tetzlaff | Hill  |
| 250   | Cooper | Verbeck  | Hill  |
| 275   | Cooper | Verbeck  | Hill  |
| 300   | Cooper | Verbeck  | Hill  |

## HOW CARS WENT OUT.

| Light Car Race.    |           |     |  |
|--------------------|-----------|-----|--|
| Car                | Driver    | Lap |  |
| Ford               | Pratt     | 9   |  |
| Maxwell            | Caldwell  | 20  |  |
| Studebaker         | Rhodes    | 35  |  |
| Maxwell            | Crawford  | 35  |  |
| Heavy Car Race.    |           |     |  |
| Mercer             | Wishart   | 12  |  |
| Mercer             | De Palma  | 23  |  |
| Macomber           | Leach     | 29  |  |
| Macomber           | Mansfield | 37  |  |
| Stutz              | Magone    | 47  |  |
| Mercer             | Oldfield  | 59  |  |
| Free-for-All Race. |           |     |  |
| Flat               | Tetzlaff  | 88  |  |





Start of the Heavy Car and Free-for-All Events in the Road Race at Corona, Cal.

cubic inches piston displacement and under, the distance being 102.45 miles. The starters were as follows: Frank B. Goode, Studebaker; Edward Waterman, Buick; Rev. Earle Schnack, Ford; Earle Jackson, Reo; Harry Rhodes, Studebaker; Pratt, Ford; Rascher, Ford; Caldwell, Maxwell; Crawford, Maxwell; Troebbe, Studebaker.

Upon the face of the returns, Waterman returned a victor in the Buick, his time being 1:37:26. Jackson in a Reo was second in 1:41:06.4; Goode in a Studebaker, third in 1:46:00, and Schnack in a Ford, fourth, in 1:57:22. There was a possibility that this standing might be changed as the result of a protest, since on the next to the last lap Waterman passed the pits, and when just over the line threw his motor into reverse to back up to them. Referee Mitchell saw the move and immediately forced the Buick around the course. The time at the finish gave the Buick a new world's road racing record for the class of 63 miles an hour.

The two big races were run together. That for 251.97 miles was for heavy cars, 231 to 450 cubic inches piston displacement, and it was in this event that Cooper made his world's class record. The starters were: Barney Oldfield, Mercer; Felix Magone, Stutz; Tony Jeanette, National; Ralph De Palma, Mercer; Spencer E. Wishart, Mercer; Earl Cooper, Stutz; Wilson, Marion; C. H. Taylor, Marmon; Joseph Mansfield, Macomber; P. E. Leach, Macomber.

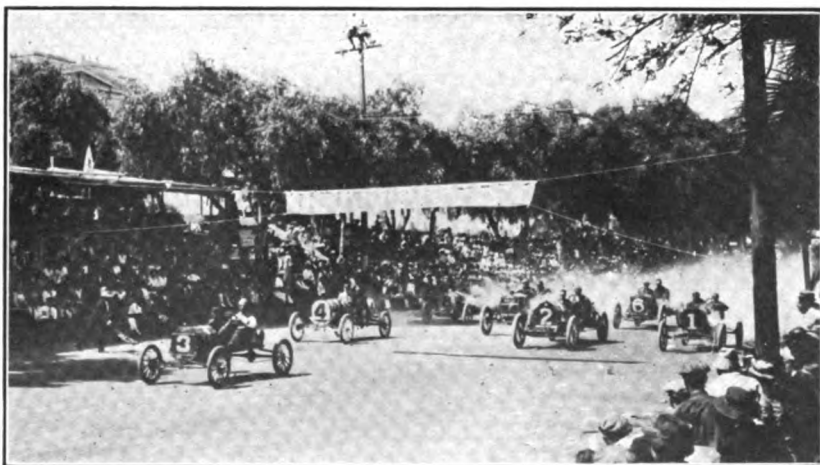
The two Macomber cars were entered by Willis George Emerson. They were each fitted

with the new Macomber rotary valve motor, and for this reason there was considerable interest in their performance. Both got away well, Mansfield's car making an average of nearly 66 miles an hour during the early rounds of the course. Leach's machine reached a speed of 75 miles an hour at one time, but shortly afterward was forced to withdraw on account of engine trouble. On the fourth lap Leach challenged Oldfield to a brush, in which the rotary valve engine appeared to be capable of holding its own, at least for

short distance spurts. Mansfield's car stayed in the race for 37 laps.

The heavy car race was won by Cooper in the Stutz, his time being 3:21:29.2. C. H. Taylor in a Marmon was second in 4:09:33, and Tony Jeanette in a National was flagged in third position. Cooper was the only one of the three to continue in the free-for-all, in which three Fiat cars, driven by George Hill, Frank Verbeck and Teddy Tetzlaff, also competed. Cooper's winning time in this event was 4:02:38. Verbeck was second in 4:10:20, and Hill was flagged in third position. Tetzlaff was forced out just before the free-for-all really began.

The positions of the leaders in all three races, at important points, are given in an accompanying table, as well as the points at which the various cars went out of the running. The course was approximately three miles in length. Tire trouble was frequent, due largely to the extreme heat and the fast pace set up by the leaders.



Cars Lined Up at the Start of the Light Car Race in the Recent Corona Meet.



## REO ADDS ELECTRIC LIGHTS AND STARTER.

**A** FULL equipment, including electric lighting and motor starting, newly designed bodies and a reduction in the selling price are

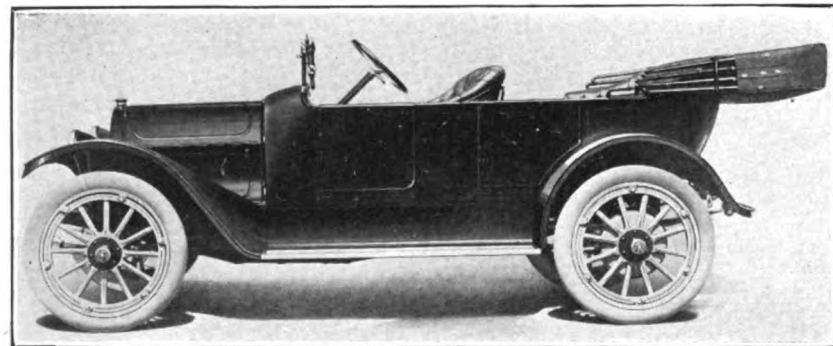
the top, which is a high grade mohair. The lighting and motor starting system is a unit and the former includes a dimming device whereby

the headlights may be utilized in sections where the ordinances prohibit the use of searchlights and when passing teams in the country, etc. The tire carrier is fitted at the rear and the new design includes a bracket for the tail light and license plate. The indicating instruments are neatly mounted, the speedometer, lighting switch, etc., being set flush with the polished surface of the instrument board. The reduction in price and the addition of equipment has been made possible by the production of

one chassis and the standardization of parts.

For the benefit of those not familiar with the mechanical details of the Reo the Fifth, it is stated that the motor is a four-cylinder of the L head type, with the cylinders cast in pairs and having a bore of four inches and a stroke of 4.5. Although rated at 30-35 horsepower, it is stated to have developed considerable in excess of the amount which is conservative when the piston displacement of 226.2 cubic inches is considered. The crankshaft bearings are three in number and these and other interior components of the power plant are very accessible from the outside.

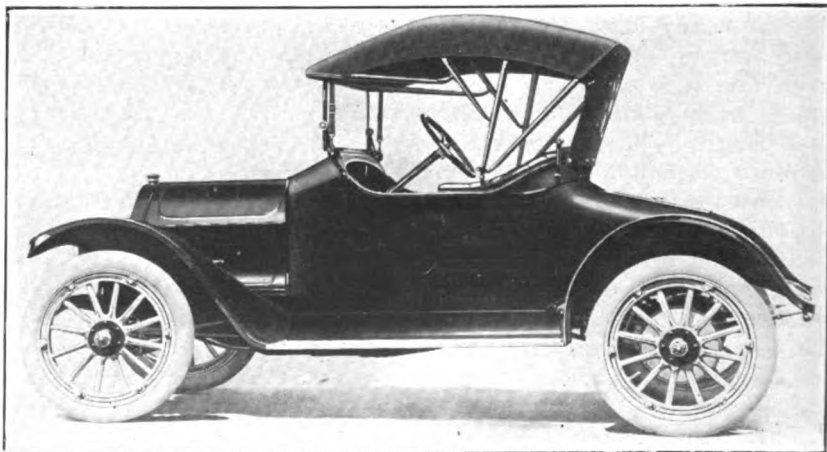
Cooling is by a gear driven pump, the water jackets being very liberal in size, and the exhaust valves are directly in the path of the incoming fluid. The radiator has sufficient capacity to



**Reo the Fifth Five-Passenger Touring Car, Which Comes Completely Equipped, Including Electric Lighting and Motor Starting.**

among the features of the new fall series of the Reo the Fifth, made by the Reo Motor Car Company of Lansing, Mich., for which R. M. Owen & Co., New York City, is general distributor. The one chassis will be continued with the same mechanical features in the main, the efficiency and durability of the model having been amply demonstrated in service during the past season. A number of minor changes have been incorporated, these including an improvement to the transmission making for quietness and efficiency. Two bodies will be fitted, a five-passenger touring and a two-passenger roadster, and both are suspended lower than formerly. They have a neat cowl dash and a gondola back, which provides additional room in the tonneau of the touring model. The body of the roadster is particularly well designed and the compartment at the rear is sufficiently large to accommodate tools, baggage, etc. The upholstery and finish are first class in every respect and the interior is as attractive as the exterior.

That the purchaser will receive considerably more value for less money is noted in the equipment. Formerly the top, rain vision windshield and speedometer were listed extra. This year they are included as standard with an electric horn, extra demountable rim, full equipment of tools, etc. Side curtains and a slip cover come with



**Reo the Fifth Roadster, Having Newly Designed Body and the Same Accessories as the Touring Model.**



meet the requirements of the severest kind of service. The usual adjustable fan is provided. Lubrication is a combination splash and pressure system, a pump maintaining the proper level of oil at all times.

The clutch is a multiple disc and includes an automatic device, preventing dragging of the plates. The transmission is of the selective type, providing the conventional three forward speeds and a reverse, and the gear change lever is located at the centre and is fitted with a "cane" handle. The last named has a very short throw and easy changing of gears is a feature of the design.

Drive is by shaft to a bevel gear semi-floating rear axle, which is sturdily constructed, as formerly. Roller bearings are utilized throughout. The wheelbase is 112 inches; tread standard, 56 inches. The tire dimensions are 34 by four inches, and quick detachable, quick demountable rims with one extra member are fitted.

The driver is placed at the left with control lever at centre. The pedal control of the Reo differs from conventional practise in that the clutch also actuates the service brake, while the emergency is operated by another pedal. This permits the driver to employ both hands for steering. Instead of rods and linkage, the brakes are actuated by ample sized cables, making for quiet operation. Both sets are easily adjusted.

### STEWART HUB ODOMETER.

#### New Mileage Recording Device Particularly Adaptable to Commercial Car Service.

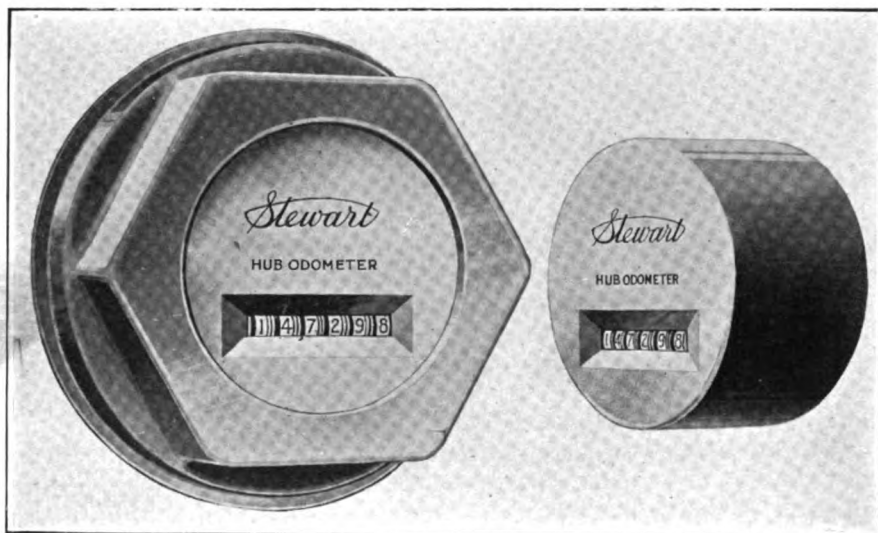
The value of checking the performance of the mechanical transport in service is conceded to be important by those who desire to determine the exact cost of the delivery system. Given the mileage, the cost a ton-mile, etc., may be obtained, and with the electric vehicle it is possible to note the mileage a charge of the batteries.

The Stewart-Warner Speedometer Corporation, Chicago, is manufacturing a new hub odometer which is designed particularly for com-

mercial vehicle service, but adapted to any make of electric or gasoline car. The device is very compact, as will be noted by the accompanying illustration. It is attached to the hub of the machine, being enclosed in a cylindrical casing, and is provided with a flat dial with the numbers showing in a slight recess.

The odometer registers 100,000 miles for the season, the numerals being black on a white background and their size such that they are read easily. The instrument also shows fractions of a mile in tenths. The drive is positive through steel pinions of the spiral type, and each of these is machined from a solid piece of high grade steel, carefully heat treated and hardened to resist wear.

Through an ingenious application of the "Geneva Stop" mechanism the dials are locked, ex-



New Stewart Hub Odometer Having Positive Gear Drive and 100,000-Mile Season Register, Also Fractions.

cepting at the instant of registering, and those not moving remain locked, a construction making for accuracy. The maker states that the odometer is springless, and that there are no pawls, ratchets, etc., in the mechanism. The new instrument is known as the model H.

The latest number of *The Goodrich*, the monthly house organ of the B. F. Goodrich Company, Akron, O., contains much of interest to both dealer and owner. The booklet is well illustrated and the text matter is prepared in a manner to indicate the varied service in which Goodrich tires are performing satisfactorily. An article of more than usual interest to the owner is that dealing with the winning of the Glidden tour by the Metz team, shod with Goodrich tires.



## KEMCO GENERATOR REPLACES THE FAN.

**A**N INGENIOUS and practical application of a dynamo for generating electricity for the automobile not equipped with a lighting system

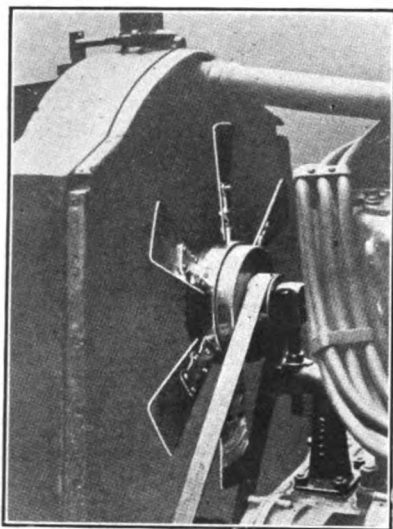


Fig. 1—Kemco Fan Generator Installed.

has been brought out by the Kouyoumjian Electric & Manufacturing Company, Cleveland, O. It is designed especially for used machines and where the installation of a conventional generator would involve considerable alterations, as well as expense. The simplicity of the design and the ease of fitting will be seen by an accompanying illustration, Fig. 1, which shows the generator installed on a standard type of car. The Kemco generator is cylindrical in form; is mounted on the fan bracket, and, replacing as it does the original fan, virtually does not require additional space for installation or special fittings. The compactness of the design is indicated at Fig. 3, which shows two types of fan pulleys, a V and a flat member. Any standard belt may be utilized. The method of conducting the current generated is also outlined, it also being possible to bring out the leads from the side of the spindle as shown by the dotted lines.

Drive is by the regular fan belt, the maker of the Kemco generator supplying with the dynamo a pulley which will provide the proper ratio between the driving and driven members, which are proportioned to meet the requirements of the motor; that is, the crankshaft or camshaft speed of the engine. By this arrangement it is a simple matter to enlarge or decrease the diameter of the generator pulley to obtain the desired output of current and to change the charging rate. This construction permits of using the generator on another car, the only change necessary being that of fitting a new pulley. In the event of a change it would not necessarily involve the fitting of a new pulley to the generator as a new driving member could be utilized.

The Kemco generator differs from conventional construction in that the field is fixed in the centre, the armature revolving outside it, whereas in usual practise the armature rotates within the field. The design has many advantages, among which are mentioned dissipation of the heat and more certain retention of the windings. The latter feature is obtained because centrifugal force tends to force the winding in and not out of the slots. The brushes utilized are of the standard round type carbon, the maker stating that one set will operate 50,000 miles without replacement, and that an electric light carbon could be employed if necessary.

While it would appear to those not familiar with the principles involved in cooling by air currents that in utilizing that space occupied by the fan hub for the generator, the fan efficiency would be reduced, this does not obtain in practise, as it is well known by engineers that the inner end of a fan blade is of very little use. Tests conducted by the maker of the Kemco device are said to have demonstrated that it improved the efficiency of the fan in that energy is not expended in drawing air in a reverse direction through the fan centre. The light weight of the generator and the use of high grade bearings are factors making for a minimum consumption of motor energy. Another important feature is that the operation of the dynamo is noiseless. The enclosure of the

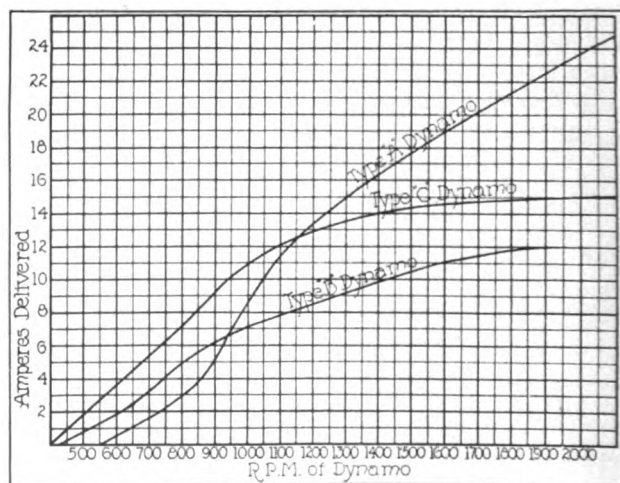


Fig. 2—Tests of Kemco Fan Generator Showing Ampere Output at Constant Voltage of Six Volts and Varying Speeds.

generator is such that it is stated that it is impossible for water, oil or dust to find its way into the dynamo.



The complete system includes, in addition to the generator, a small, compact ammeter for mounting on the dash; a cut-out, a switch and a distributor.

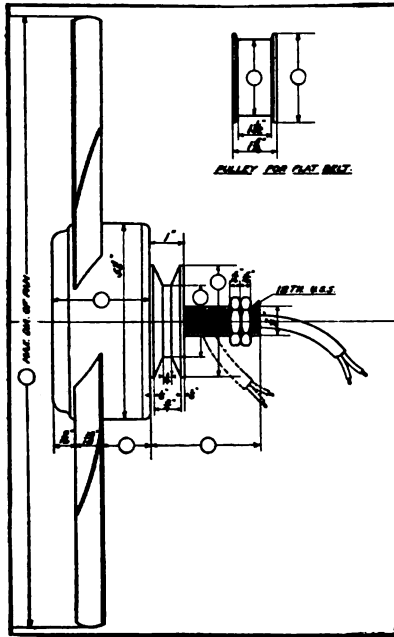


Fig. 2—Dimensions of Generator.

battery when the dynamo develops a proper charging rate, and to cut it out when the output is such that the battery would discharge through the generator. In the Kemco system the cut-out or control member is incorporated with the ammeter. The latter not only indicates the output of the generator, but any slipping of the belt is also detected. The usual provision for adjustment of the belt is included.

The maker of the Kemco generator states that its charging characteristics are such as to maintain the battery in a properly charged condition and that the cells are protected against heating from overcharging. The generator begins to charge at a high rate at low speeds and the output decreases at high ratios. This makes for efficiency in that the car may be operated around town as well as utilized in touring. The battery may be employed in connection with any type of motor starter having a good efficiency and torque. The generator begins to charge the battery at 400 revolutions a minute and the output in amperes of three types of Kemco dynamos is shown in the chart at Fig. 2. The output above a predetermined amount is electrically controlled.

The wiring plan shown at Fig. 4 is simple—two leads from the dynamo connecting with the base of the combined cut-out and ammeter, thence to the battery, which is a six-volt unit. All current utilized for the lamps, etc., is drawn from

the battery as previously pointed out, a distributor providing connections for the various wires to the lamps, and control of the last named members is by the usual multiple switch. Duplex wire is utilized and as the leads are thoroughly protected, no trouble should be experienced in the nature of leakage due to short circuits. The simplicity of the system and the ease of installation should appeal to motorists wishing to install a lighting system without alteration of the power plant and where space does not permit of the use of a conventional design.

### MAXWELL IN SOUTH AFRICA.

#### William Campbell of Johannesburg Takes Agency After Visiting the Factory.

William Campbell of Johannesburg, South Africa, was a recent guest at the factory of the Maxwell Motor Company, Detroit, as a result of which he has signed a contract to represent the company in that country. He is a man of long experience with large organizations in South Africa, and is vice president of the British Manufacturers' Representatives' Association, as well as as a member of the Johannesburg chamber of commerce. Concerning the situation in his country he has the following to say:

The country is in the infancy of its development. That development is working in right lines and the future is very promising. Producing at present nearly \$200,000,000 in gold, over \$45,000,000 in diamonds and more than \$13,000,000 in ostrich feathers, it has turned its atten-

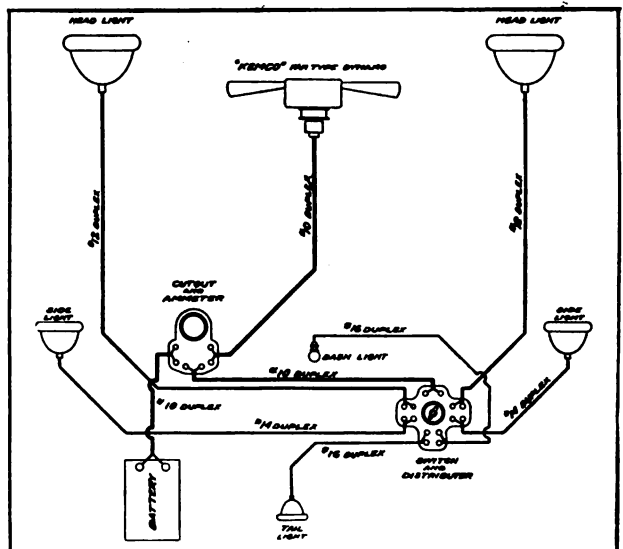


Fig. 4—Wiring Plan Is Simple, the Battery Being Floated on the Line and Current Supplied to Light Through a Distributor.

tion seriously to the vast agricultural possibilities. These conditions make for wealth and the American car, being especially adapted to the needs and roads of the country, should have a splendid future there.



## WITH THE MOTORING INTERESTS ABROAD.

### Many American Manufacturers Will Make Display at Paris Salon---Vauxhall Secures New World's Records---Gray & Davis Invades England---Foreign News Notes.

**A**MERICA appears to be taking a decidedly greater interest than ever before in the Paris Automobile Salon, which will be held in the Grand Palais, Oct. 17-27. It will be noted, as well, that the date is much earlier than usual, the show having been held in December in former years, and generally for practically a full month. This action on the part of American manufacturers is not surprising in view of the situation with respect to the market for these products in France and other sections of Continental Europe, for which the Paris Salon is the accepted meeting place.

In the drawing for space the Hudson Motor Car Company, Detroit, secured stand No. 1, directly opposite the main entrance and easily the most desirable in the hall from many viewpoints.



**Eighteen Horsepower Wolseley Car of British Make Finds Poor Road Conditions in South Africa.**

Applications for space have been received from 635 firms, which is the largest number ever received, exceeding that for the 1912 display by five.

Besides the Hudson maker, the following producers of cars will show direct: Buick Motor Company, Flint, Mich.; Cadillac Motor Car Company, Detroit; Ford Motor Company, Detroit; Hupp Motor Car Company, Detroit; Mitchell-Lewis Motor Company, Racine, Wis.; Willys-Overland Company, Toledo, O.; Packard Motor Car Company, Detroit; Studebaker Corporation, Detroit; Thomas B. Jeffery & Co., Kenosha, Wis., and J. I. Case Threshing Machine Company, Racine, Wis. Makers of accessories and supplies will display direct as follows: Stewart-

Warner Speedometer Corporation, Chicago; Vacuum Oil Company, Rochester, N. Y.; Lovell & McConnell Manufacturing Company, Newark, N. J., and International Acheson Graphite Company, Niagara Falls, N. Y. Other concerns will be represented through their Paris agencies.

#### NEW WORLD'S RECORDS.

##### Vauxhall Exceeds Long Distance Marks Held by Single-Sleeve Argyll.

A. J. Hancock, driving a 25 horsepower Vauxhall of the so-called Prince Henry type, secured new world's records from 300 to 700 miles, and for four, five, six, seven, eight and nine hours, on the Brooklands track, Weybridge, England, early in the month. While some of these were previously held by the 15-30 horsepower Argyll, with single-sleeve valve motor, the latter car still holds the marks for 800, 900 and 1000 miles. Hancock went out to take all records to 1000 miles, but met with an accident at the end of nine hours. The new and old marks are presented in comparative form in the accompanying tables:

| Miles | Former Holder | Old Record | New Record |
|-------|---------------|------------|------------|
| 300   | Thames        | 3:30:17.54 | 3:15:24.72 |
| 400   | Dietrich      | 4:34:23.87 | 4:21:14.99 |
| 500   | Dietrich      | 5:48:38.87 | 5:34:10.34 |
| 600   | Argyll        | 7:40:49.63 | 6:46:57.27 |
| 700   | Argyll        | 9:06:53.76 | 7:58:42.74 |
| Hours | Name          | M.P.H.     | M.P.H.     |
| 4     | Dietrich      | 86.19      | 91.64      |
| 5     | Dietrich      | 84.59      | 91.30      |
| 6     | Dietrich      | 86.36      | 90.18      |
| 7     | Argyll        | 77.81      | 88.60      |
| 8     | Argyll        | 77.79      | 87.76      |
| 9     | Argyll        | 76.74      | 83.31      |

#### ENTERS BRITISH FIELD.

##### Gray & Davis Electric Lighting and Starting System Goes Abroad.

According to the Autocar, a British motoring print, Gray & Davis, Inc., Boston, Mass., is soon to place its electric lighting and starting system in that market. This action is of exceptional interest, because of the well known lack of such equipment on cars sold in Great Britain. It may also be taken as an indication of the results to be obtained by American manufacturers from the recent visit of members of the Institution of Au-



tomobile Engineers to this country.

The foreign method of sale, in which the manufacturer produces the chassis only, the purchaser having the body and equipment supplied to his specifications, brings about very different results from those obtaining in America. Several of the British engineers expressed themselves, while in this country, as convinced that the motoring public at home would very shortly come to realize the value of motor starters, and that another year would see them much more generally used. Thus far, very few British manufacturers have turned their attention to this subject, but it will prove of interest to note the success attending the introduction of the Gray & Davis equipment abroad, and its effect upon the display of cars at the forthcoming Olympia show.

#### NEWS NOTES FROM FOREIGN LANDS.

The Automobile Club of Moscow, Russia, is planning a race, starting and ending at Moscow and visiting Orel and Kharkoff.

Owing to the lack of support from the trade, the idea of holding a motor show at Sydney, New South Wales, has been abandoned for this year.

The next Belgian automobile show will be held at Brussels, Jan. 10-21. Applications for space closed Sept. 15 and the drawing will be held Oct. 4.

Denmark has agreed to join the International Automobile Convention with regard to touring motorists and the use of the international pass, as from May 1, 1914.

In order to adapt the roads of France to motor tourist traffic, the government proposes to spend \$50,000,000 during the next 10 or 12 years on tarring about 6000 miles of highway.

The rules and regulations for the 1914 Targa Florio race, which will take place in Sicily, May 24-25, provide that the event will be open to all cars with a maximum engine capacity of nine litres (549 cubic inches).

Col. Magrath, the veteran Irish motorist, has died at his home in County Wexford, at the advanced age of 86. Col. Magrath was among the first men in the British Isles to own and operate a car, and as such was held in high esteem by all British motorists.

Australia is the latest country to join the automobile industry, an engineering firm in that commonwealth now being engaged on the first model of a car designed and constructed entirely by Australians, and with but a few exceptions wholly of Australian materials.

Twenty-four cars were entered for the Coupe de L'Auto race over the Boulogne circuit in France, Sept. 21, as follows: Peugeot, three; Delage, two; Koechlin, four; Th. Schneider, three; Zenia, two; Sunbeam, three; Alda, two; Anasagasti, one; Vauxhall, two; Buick, two.

The fifth race for the O'Gorman trophy will be held on the Brooklands track, Weybridge, England, Sept. 27. The conditions specify that the car shall be propelled by means of an internal combustion engine, but option is allowed as to the kind of fuel employed, as well as auxiliaries, such as compressed oxygen, acetylene, etc.

According to the official report concerning the value of cars imported into France during the six months ending June 30, 1913, there was an increase of nearly 65 per cent. over that for the corresponding period in 1912, or as \$1,335,000 to \$2,172,000. Great Britain occupies first place in value of importations into that country, and the United States second.

An evidence of the increasing interest in motoring in India is found in the recent publication of a special au-

tomobile issue of the Statesman of Calcutta. The number consisted of 40 pages, 18 of which were devoted to motoring subjects and announcements concerning the many large firms engaged in the automobile industry in India.

New motoring regulations went into effect in Spain, Sept. 1. After that date all cars in the country, with the exception of those owned by foreign tourists, must be registered and carry an identification plate at both front and rear, with letters and numbers in black on a white background. A system of licenses for drivers also has been instituted.

That motoring has secured an important foothold in Ireland, since the expenditure of road funds by the British Road Board, is borne out by the fact that the Royal Irish constabulary has established a number of speed traps and three motorists were fined for speeding in one day recently by the Kingstown police court. The first defendant was accused of travelling at 28.5 miles an hour.

The prefect of police in Paris, acting in conjunction with the chief inspector of mines, has issued an order, in which it is recognized that operators engaged in testing machines on the road must necessarily exceed the legal speed limit of 18.75 miles an hour at times. No prosecutions for such offenses will be made, providing they occur after 7 in the morning from April 1 to Sept. 30, and after 8:30 in the morning from Oct. 1 to March 31.

#### REPORTS CONDITIONS GOOD.

##### Maxwell Sales Manager Returns from Eight Weeks' Trip About the Country.

C. F. Redden, sales manager of the Maxwell Motor Company, Detroit, has returned to the factory after an eight weeks' trip about the country, during which he visited all the distributing branches of the company and travelled some 25,000 miles. In each of the large centres district meetings were held, at which Mr. Redden had opportunity to talk with the dealers throughout each particular section—some 1500 all told.

As a result of this trip and the intimate association with the men in the field, he says that if all companies enjoy at least one-half the success now assured to the Maxwell concern, 1914 will prove a banner year for the industry. He adds that although the company is now making daily shipments of each of its three models, it has been impossible to keep up with the demand. However, increased facilities and organization are expected to remedy this condition in the very near future.

Under the auspices of the Chicago, Black Hills & Yellowstone Park Highway Association, a party in a Studebaker car has just laid out a more direct motoring route to this national reserve from Chicago. The way leads through Madison, Racine, Mankato, Pierre, Rapid City, the Black Hills and Cody, Wyo. It is said to be both shorter and better than the former route by way of Denver.

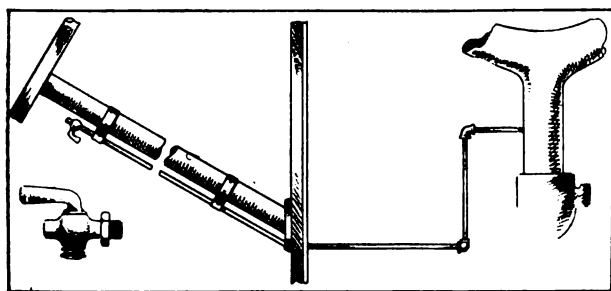


## MECHANICAL NOTES FOR OWNERS.

### Inexpensive Device for Steering Column Control of Air to Carburetor---Cleaning and Adjusting Ball Bearings---Heating the Carburetor---Suggestions from Readers.

**O**BTAINING the proper proportion of fuel to air to secure maximum efficiency from the motor requires some experience in the adjustment of the carburetor. With the modern type having two jets and an auxiliary air to set, the work is simplified to a certain extent in that the carburetor may be adjusted for low and high speeds, and independently. With certain types, however, it is difficult to obtain what may be termed an all around mixture; that is, one that will be rich enough to permit of easy starting of the engine in cool weather and yet not be too rich when the car is travelling at 20 to 35 miles an hour.

In the majority of instances where trouble of this nature is experienced, it may be said to be due largely to the condition of the motor. When the engine is new it is a simple matter to set a carburetor and to obtain satisfactory results, as



Steering Column Control of Supplementary Air Supplied to the Intake Pipe, a Device Facilitating Carburetion.

far as both efficiency and economy are concerned. But when the valve guides begin to wear, admitting auxiliary air, and extra atmosphere finds its way through poorly fitted gaskets, etc., trouble is experienced.

Of course the most satisfactory method is to eliminate all superfluous air, but this is not always easily accomplished with some types of motors, especially those in which the valve guides are cast integral with the cylinders. Under such conditions the cylinders must be displaced, guides bored and new valve stems fitted. Sometimes it is possible to cut a thread and fit a stuffing box as outlined in the issue for Aug. 25.

An ingenious method of overcoming carburetion trouble was noted by the writer recently. The owner had not experienced any great difficulty in adjusting the carburetor, but found he

was obliged to change the mixture for starting and operating; that is, more fuel was necessary for starting, after which it had to be cut down. The carburetor was not fitted with an auxiliary air intake, the design being supposed to supply air in proportion to the fuel at all motor speeds.

The installation of the device is shown in an accompanying illustration which is practically self-explanatory. As will be noted, it comprises a pipe tapped into the intake pipe above the carburetor and extending through the dash, and fitted to the steering column. At the top of the pipe is fitted an ordinary petcock. The latter is kept closed until the motor has warmed up and then gradually opened until the best operating results are obtained.

The object of the device is to admit auxiliary air into the intake pipe, supplying additional atmosphere as required, and it also serves to break up and convert into vapor any particles of fuel not atomized by the carburetor. The owner states that since its installation he has increased the mileage a gallon of fuel to a considerable extent, and that more power is secured than formerly.

The cost of the stock is slight, it comprising a suitable length of .125 inch pipe, four elbows and a petcock. The material can be secured at any plumber's or supply house, and cut and threaded to dimensions. The installation might necessitate the removal of the intake pipe, but in the case mentioned the induction member was made in two sections, facilitating the work. The hole in the intake pipe could be drilled and tapped without displacing if sufficient care were exercised in the work, but the carburetor would have to be removed to prevent the chips of metal falling into it.

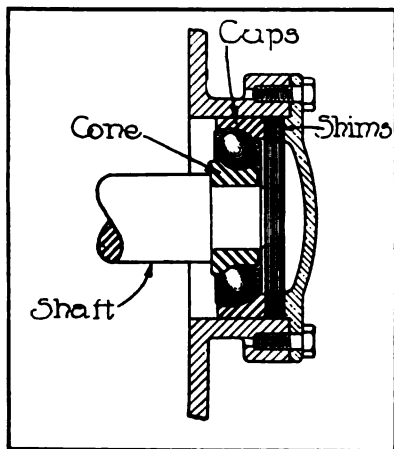
### ADJUSTING BALL BEARINGS.

With the growing tendency to utilize ball bearings in the motor car the owner should have at least a working knowledge of how to clean and adjust these members. The following suggestions of the New Departure Manufacturing Company, Bristol, Conn., maker of ball bearings, will be of service to the owner in the care and maintenance of his car.

A ball bearing must have a certain amount of running clearance, being less than with plain bearings, and



it is common practise to allow a radial freedom never greater than .001 inch. In connection with this, in single radial bearings an axial freedom or end play of the inner race relative to the outer is allowed, this varying with



Shimming Ball Bearings.

the size of the bearing between the extremes of .0005 to .005 inch for new bearings. Thus a properly made and installed bearing will not deteriorate; that is, there will be no reduction in diameter or increase in bore. If there is an excessive amount of radial or axial motion, it is invariably caused by the admittance of some abrasive between the parts or by overload. The amount of wear will depend upon the cutting power of the grit, the pressure and the length of time the foreign matter is between the surfaces.

Many bearing troubles have been traced to the presence of dirt and metallic particles in the rear axle, transmission, etc. Many causes of failure are also due to rust created by the indiscriminate application of a stream of water at 40 to 50 pounds pressure a square inch to the parts of the car in which the bearings are mounted. That rust is absolutely destructive to ball bearings has been proven and the effect of rust is easily pointed out when it is considered that the finish of the balls is to .0001 inch and the deposits of rust establish a greater thickness. The results of rust are noted easily by even the novice, being indicated after cleaning by pits or depressions. While these minute irregularities are sometimes caused by overloading and the flaking off of the metal, which results from this condition, if due to causes other than rust and acid, the roughness would be confined to the ball tracks, whereas excoriations resulting from chemical action will be in evidence on all parts of the bearing.

A good lubricant for bearings is a slush made of pure vaseline and lighter mineral oil, this being heated to make its viscosity less and enable it to penetrate all parts of the bearings. When the bearing has been dipped in this and allowed to remain long enough to permit the oil to reach all parts, it is taken out and allowed to cool, and the surplus lubricant wiped off the outside. Such a mixture will stay in place and will not run out like lighter oils, and at the same time its viscosity is not so high that it will produce unnecessary friction.

Bearings should not be cleaned in dirty gasoline in which other parts have been washed. A simple solution of common washing soda and hot water is easily made by using about a handful of soda to a pail of boiling water. The fluid should be kept hot while it is being used. The bearings should be dipped in the fluid to remove all dirt, then immersed in clean kerosene and thoroughly washed. It will take but a few minutes to accomplish both operations, after which the bearings should be inspected.

In adjusting New Departure or other cup and cone type bearings care should be taken not to have them too tight or too loose. The condition of the bearings may be ascertained by jacking up the wheel, then grasping the wheel rim at opposite points and shaking the wheel. Any looseness in the bearings can be detected by the lost motion between the wheel hub and spindle. (Play in the spindle pin or bolt should not be confounded with that in the bearings, and if the bolt is worn it is best to chock the spindle with a piece of wood.)

In taking up lost motion considerable judgment must be exercised in screwing up on the adjusting member, not to get this too tight and impose an injurious end pressure of the balls. An excess pressure that will stress the bearing parts dangerously will not make much difference in the wheel resistance when turned by hand, though when the car weight must be sustained at high

speeds or when going around corners, the resistance will be increased materially and bearing endurance reduced in proportion.

A safe rule to follow is to take up the wear by screwing in the adjustment nut so that the shake or looseness will be eliminated, yet permit the wheel to spin for a few revolutions when given an initial impulse. Many motorists and even inexperienced mechanics commit the error of adjusting bearings of the take-up type too loosely. This is not desirable, any more than fitting parts too loosely together is. Always lock adjustment nut firmly in place when proper adjustment has been secured.

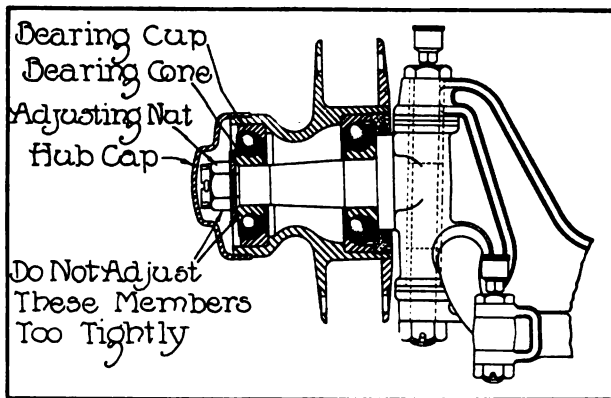
In some gear boxes and axles the bearings are shim adjusted. A number of thin washers of sheet brass may be interposed between the bearing cup and the retainer cap, as shown in an accompanying illustration. When taking down an assembly of this nature always keep the shims from any bearing box together and tagged for future identification to insure that the adjustment made in the factory will be maintained in the reassembly. If the bearings are loose for any reason, add thin shims about .005 inch thick to the others, until there is no appreciable lost motion and yet no binding between bearing parts.

### HEATING THE FUEL.

It is noticeable that the modern motor comes equipped with means for heating the fuel, the object being to increase its volatility, which is essential in cool weather owing to the density of the gasoline. This is obtained by utilizing the warm water from the jackets or by the heat of the exhaust. The following suggestion for using the last named method is contributed by a reader who experienced carburetion troubles.

I am sending you a rough sketch of a device I constructed to supply hot air to the carburetor, which is a Schebler having a tube like air intake. Both the intake and exhaust manifolds are on the same side of the motor, which made it an easy matter to install the device.

I took an ordinary tin funnel and compressed the large end, then cut out two places at the ends to fit the exhaust pipe as shown in the accompanying drawing. I next had a pipe made of heavy tin to fit the opening of the air intake and made this a drive fit. The other end of the tube was fitted over the spout end of the funnel, which was cut off near the funnel proper to obtain the same diameter as that of the air intake of the carburetor. The pipe was soldered to the funnel and the other end pushed into place and taped. The top of the funnel was

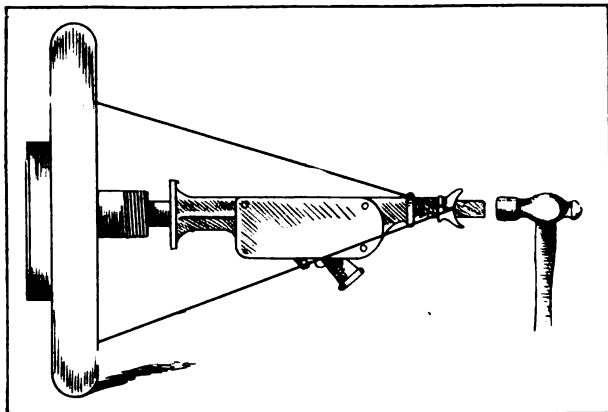


Components of Ball Bearings Used in Adjusting and Parts Requiring Care in the Work.

secured to the exhaust pipe by brass wire which was twisted tight. Since its installation I have obtained good results from the carburetor and use less gasoline than formerly. I am going to experiment with the device



when it becomes cold, as I believe that by squirting gasoline into the funnel end of the device I can get a rich enough mixture to start when it is very cold.



Showing How Jack May Be Employed for an Emergency Wheel Puller.

The device constructed by the reader is ingenious because of its simplicity and low cost. It is not, however, new. The Ford Motor Company fitted a similar arrangement on its four-cylinder model B touring car, which was marketed several years ago. Relative to the priming suggestion, it should aid in starting and the writer would appreciate a report on the results obtained.

### JACK AS A WHEEL PULLER.

Some types of axles require the services of a wheel puller to remove the wheel, and although one of these tools may be included in the garage equipment, it is possible that their service will be required on the road. If the puller is not carried in the tool kit and the wheel must be removed, it may be accomplished with the jack as shown in an accompanying illustration.

Remove the hub cap and place a piece of wood between the end of the axle and the base of the jack. Next pass a rope round a spoke, over the head of the jack and tie the other end of the rope to a spoke as shown in the drawing. It should be drawn and tied snugly. By operating the jack in the usual manner, the rope will be drawn sufficiently tight to exert a strong pull on the wheel, and tapping the head of the jack smartly with a hammer should start the wheel. It is best to use a piece of hardwood on the head of the jack.

### RADIATORS AND PRIMING RODS.

In the modern automobile the manufacturer has incorporated many conveniences, such as dash or steering column control of the air admitted to the carburetor, a device decidedly useful in

starting in cold weather. There are, however, many older machines where this enriching the mixture by closing a butterfly valve is obtained by actuating this member by a wire or rod passing between the openings in the radiator. Use of the wire results in wear on the fins, especially if the pull be exerted in such manner as to cause the rod to bear against the other metal.

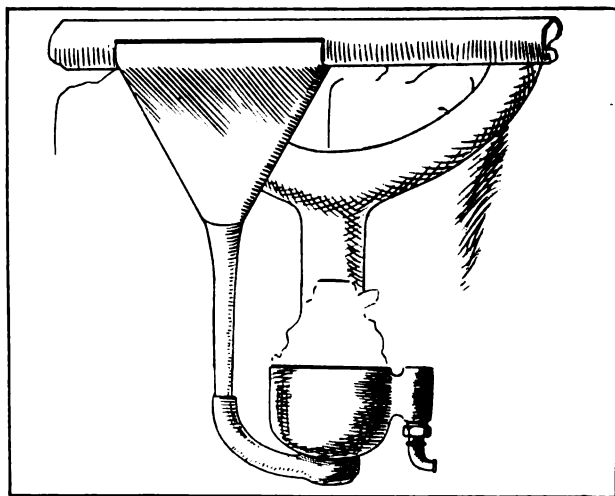
It should be remembered that the material in the radiator is very thin and the point where the wire comes in contact is difficult of access for repairs in the event a leak is incurred. It is not a difficult matter to fit a piece of fibre having sufficient opening for the wire to pass through, in the cooler, thereby preventing injury to the fins.

### GENERATOR HINT.

Among the causes of failure of carbide generators is lack of attention. The average user is content with dumping out the residue and renewing the supply. To obtain efficiency the generator should be thoroughly cleaned, and when the water drips into a perforated receiver, this member should be removed and washed. The stopping up of the apertures is largely responsible for the delay in securing "gas" when one is in a hurry.

### WHEN SHORT OF KEROSENE.

Kerosene is still utilized in the lamps on a large number of cars and the cheapness of the



Suggestion of a Reader for Conveying Heated Air to the Intake of the Carburetor.

fuel does not prevent one being caught on the road with an insufficient supply, and where oil is not easily obtained. In the event the oil is



consumed in the side lamps, it is a simple matter to utilize the headlights, and while it is rare one will be caught without enough to fill at least the tail light by using what remains in the side members, it has been known to happen. The writer was caught in this predicament, through the wick in the tail lamp being very short. By using sufficient water to bring the kerosene up to and cover the wick, the trip was completed. Of course, the lamp must be taken apart and cleaned before being refilled with kerosene.

### RETURNS FROM NEW ENGLAND.

#### President of Kissel Motor Car Company Enjoyed His Trip Very Much.

The fame of the New England hills as a touring ground is such that annually a large number of people cross the continent to take advantage of the splendid opportunities afforded. One of the most recent parties to enjoy a vacation of this nature was that of President William L. Kissel of the Kissel Motor Car Company, Hartford, Wis., who has just returned from a trip, on which the speedometer registered 3490 miles.

There were several members in the party, as is indicated by the accompanying illustration, taken among the White mountains of New Hampshire. The itinerary included Niagara Falls, the Thousand islands, White mountains, Atlantic coast resorts, Boston, New York, Philadelphia, Pittsburg, Cleveland, Toledo, Chicago and Milwaukee. Not a single car adjustment was necessary throughout the long journey and the tire troubles totalled but one blow-out and two punctures.

### GRAPHITE CUP GREASE.

#### Street Railway Finds Dixon Product Valuable for Trolley Lubrication.

When it is remembered that the trolley wheel probably is the hardest worked part of an electric railway equipment, and seldom receives attention until there is trouble, the following letter from the Lake Shore Electric Railway Company, Fremont, O., received recently by the Joseph Dixon Crucible Company, Jersey City, N. J., maker of

Dixon's graphite lubricants, will prove of decided interest:

Referring to your communication, which was in reference to your graphite cup grease No. 2, which we are using on our trolley wheels: We have been using this for the past four or five years for trolley lubrication.

We manufacture our own trolley wheels and they are so constructed that we have an extra large chamber for lubricant. We use a graphite bushing for a .625-inch pin two inches long only. We take the graphite cup grease No. 2 and thin it slightly with oil, making it somewhat thinner in the winter than in the summer. This lubricant is then forced into the chamber of the wheel with a force pump in our shop and the wheel is then put into the harp attached to the pole and is ready for service, and this is all the lubricant that is required for the life of the wheel. In the majority of cases we use the bushing over again on the second wheel. We have an air press for forcing these bushings in and out of wheel.

During the past 16 years we have done considerable experimenting in trolley wheels and lubricants with different kinds of trolley wheels and different kinds of lubricants, and it has been our experience that the Dixon graphite cup grease No. 2 is the very best lubricant that can be obtained for the purpose. On trial equipments we have operated trolley wheels for 7000 and 8000 miles;



President W. L. Kissel, Kissel Motor Car Company, and Party in the White Mountains of New Hampshire.

however, in figuring up our average mileage on trolley wheels by the year, taking into consideration wheels that are lost, broken, and in some cases stolen, our average mileage is approximately 4000 miles.

Yours truly,

FRED HECKLER,  
Supt. M. P. & C.

Something more than two years ago, Dr. G. W. Bucklin, Muncie, Ind., purchased a Waverley electric machine, made by the Waverley Company, Indianapolis, and his experience with this car has been such as to indicate to his satisfaction that it is an economical proposition. He has paid \$22.58 a year for current, and his expenditures for repairs were 15 cents the first year and \$1.40 the second. The car is equipped with cushion tires and Edison battery, neither of which had occasioned any maintenance expense.





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## LEGISLATION AND MOTORING.

The automobile industry may well question whether or not it is time to become actively interested in the matter of legislation. Each year, as the legislative season draws near, the list of proposed laws more or less inimical to the interests of motorists and motoring becomes so long as to occupy a much larger proportion of the attention of the legislators than almost any other one subject. Within the past two years the interests of owners and users of commercial motor vehicles have been seriously endangered, and last spring the owners of garages and service stations in several sections of the country were called upon to contribute their quota of tribute through special license fees or in some other

manner quite as unnecessary and objectionable.

It must be admitted that the motorists themselves are somewhat to blame, since in the beginning they were so much interested in the subject of good roads that they expressed themselves as willing to pay a special license fee, providing the funds thus collected were utilized in improved highway construction and maintenance. Through increased fees and because of their multiplicity in one form or another, the situation has now reached a point where it becomes of decided moment in the minds of those who are considering the advisability of making their first automobile purchase. It cannot be argued that these various fees do not have an appreciable effect upon the industry as a whole.

Although it has long come to be recognized that other interests benefit quite as largely because of good roads, the motorist still bears an increasing proportion of the expense. State and local commissions and officials hesitate to fulfill their part of the implied bargain and, wherever the question has arisen, are to be found arrayed against motor truck owners and users on the proposition of attempting to delay commercial progress by legislating against the modern method of transportation rather than by taking steps to place the roads and bridges in proper shape to meet the newer conditions.

Every person connected with the industry—manufacturer, dealer, garageman and owner—has a direct personal interest in the situation. Next month, candidates for public office will seek their support. There is abundant evidence that the industry must face this proposition in one form or another in several commonwealths during the forthcoming legislative sessions. Much good preliminary work could be accomplished by a consideration of the subject before reaching the ballot box.

For the first time in the history of Wisconsin, the new motoring law having gone into effect Aug. 1, it is possible to visit all the towns and cities in the state without danger of violating unknown ordinances. The new statute automatically annuls all local regulations, and the people of Wisconsin are so well satisfied with the result that it would not be difficult to interest them in the subject of uniform motoring laws for the several states.



## WITH THE CYCLECAR MANUFACTURERS.

Constructional Details and Special Features as Revealed by Producer of the Woods Mobilette--Francis R. Hoyt Designs the Falcon.

**R**EALIZING the public interest in the development of the cyclecar, The Automobile Journal has decided to devote space in each issue to this subject. Endeavor will be made to present mechanical descriptions of the various machines, so far as this information is available from the manufacturers. It will be understood that the situation at present is somewhat analogous to that which existed in the earlier days of the industry, in that the American cyclecar, at least, is more or less in its experimental stage. This should not be taken to indicate that the engineers and those engaged in their production have not studied fully the results obtained from some two years of service in Great Britain and on the Continent of Europe. Road conditions and other factors must necessarily prove of decided importance in determining the final design, but it is only reasonable to assume that present day automobile engineers will have little difficulty in solving the problems presented.

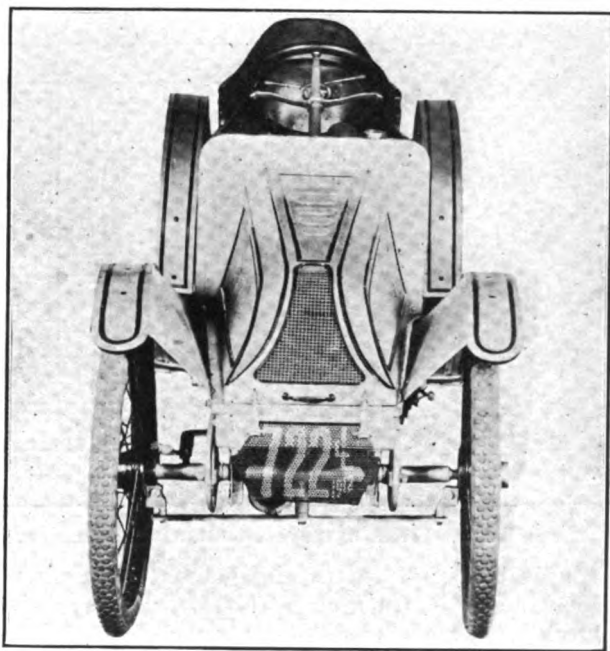
### THE WOODS MOBILETTE.

Francis A. Woods of Chicago claims to have conceived the idea of a cyclecar in 1906, which was four years before the appearance of the Bedelia, conceded to be the first cyclecar ever produced. It probably will not be maintained by Mr. Woods that at that time the idea was in concrete form, but it would appear that he began experimentation long before he knew that Barbeau had succeeded in producing a machine of the type he had in mind. In fact, the development of the Woods Mobilette seems to have been conducted wholly without reference to what was transpiring abroad.

In 1910 Mr. Woods began active work on a car, but for a time found difficulty in obviating what seemed to be a serious disadvantage in the seating arrangement. One day, while passing along the street he saw a boy who had built an imitation automobile out of bicycle wheels and a board between the two axles. On the front an inverted soap box served for the hood. For a steering gear, the boy had utilized a broomstick, which ran through the board close to the centre of the front axle, surmounted by a baby carriage wheel. One end of a piece of clothesline was tied

to the hub of each front wheel, with two winds around the end of the broomstick. From the fact that the boy straddled his board, Mr. Woods immediately evolved the tandem seating arrangement, which has been adopted by many makers both in this country and abroad.

The first model was completed almost two years ago. Subsequent road tests indicated its value from a practical standpoint, and the Woods Mobilette Company has been organized with headquarters at 1509 Michigan boulevard, Chicago. The lower floor is devoted to exhibition and salesrooms, while on the second floor are facil-



Front View of the Woods Mobilette Cyclecar.

ities for producing about 200 cars a month, it is believed. The company hopes to be ready to make deliveries early in October, thereby securing still another claim to being America's first cyclecar.

An accompanying sketch of the chassis has its principal parts lettered, so that it is possible to follow the accompanying description throughout in alphabetical order, beginning with the motor. This is located in front under a sloping hood of the so-called foreign practise, the position having been selected with a view to distributing

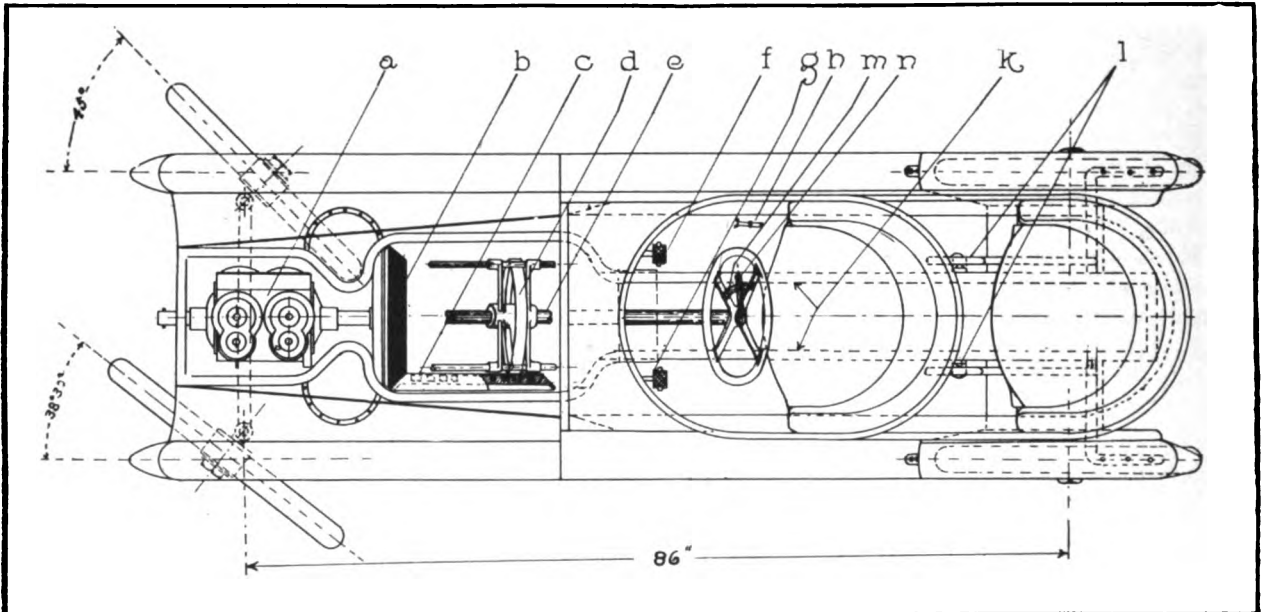


the load properly and so as to provide a free circulation of air. It will be understood from this that the motor is air-cooled. It is a two-cylinder, four-cycle unit of the V type, with bore of 3.125 inches and stroke of three, rated at 10 horsepower, but claimed to be capable of developing 14. The compactness of the power plant is still further suggested by the mounting of the magneto and carburetor in such manner as to eliminate the possibility of dirt, etc., and accessibility is afforded by lifting the hood from the front.

One of the features of the construction is the use of a specially designed friction transmission. The main friction drive wheel is indicated by b, and this is coupled directly to the engine. A counter friction drive disc c is designed to be

h to secure the desired change in speeds. This lever is moved forward to obtain the various forward speeds and backward for reversing the machine.

A plan view of the main frame is indicated by k, this being of one-piece pressed steel, light in weight and tested for strength to 300 per cent. more than required to carry and maintain the load of the car. The spring suspension is somewhat unique. The springs l are merely spirals attached to the chassis frame and partly coiled about the axles. These are held to be of sufficient leverage in length to insure absolute flexibility and easy riding. In addition, a rocker joint forward of the propeller shaft housing is designed for the double purpose of a torsion rod



Plan View Sketch of Woods Mobilette Cyclecar Chassis, Indicating the Special Features of Construction.

brought into and out of engagement with b, on much the same principle as the application of the clutch in standard automobile practise. The sketch shows this in part section so as to indicate the special fibre inserts, held to provide the highest frictional grip and long life. A third friction disc d is keyed to the main propeller shaft e, and fully trussed to insure strength. This is intended to be moved backward and forward along the face of the disc c to obtain the various changes in speeds.

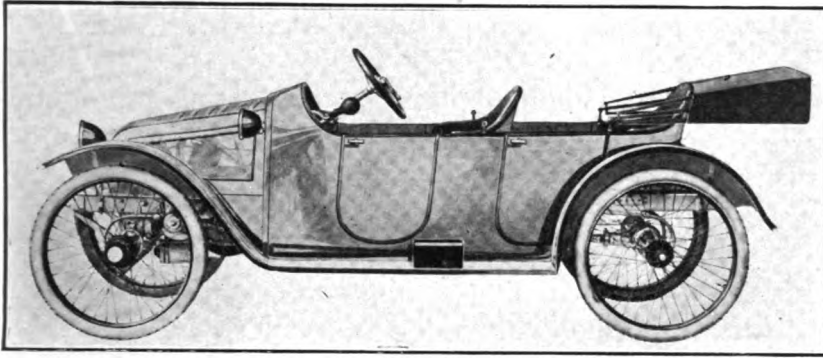
Depressing the brake pedal f throws the wheel d out of engagement with the disc c and at the same time actuates the brakes on the rear wheel hubs. The clutch pedal g throws the counter friction wheel c out of engagement with the main disc b, while shifting the change speed lever

and a hammock suspension of the body. The shock on the rear wheels over rough roads is held to be transmitted to this rocker joint and thence back to the seats, thereby reducing the shock at the latter point to a minimum.

The propeller shaft is of one-piece steel, free from gears and universal joints, self-aligning and claimed to be absolutely free from thrust strain. This drives direct through a reduction gear in the rear axle housing. The wheels are of wire, interchangeable, and of the motorcycle type, being shod with 28 by 2.25-inch tires. The wheel-base is but 89 inches and the tread 30, with a maximum width of 35 inches. The height overall is 48 inches, and the weight about 450 pounds.

Another feature is to be found in the provision for a short turning radius. It will be noted





Side View of Woods Mobillette, Said to Be America's First Cyclecar.

that the chassis main frame is looped in at the front so as to permit of turning the front wheels to an angle of 45 degrees. The steering wheel and column are of heavy construction, and the throttle and spark controls are located on the wheel as in standard automobile practise, these being indicated by m and n, respectively.

The body is of pressed sheet steel, strongly braced and ribbed, and so constructed that the rear seat is detachable, permitting of the installation of a delivery box instead, and thereby providing for two vehicles in one. The upholstery is in leather. The running boards, fenders and splash guards are formed of special sheet steel, eliminating rivets, etc., and securely held to the main frame by drop forged steel arms. The fuel tank is located in the dash, readily accessible, and provides a gravity feed for the carburetor. The general appearance of the car is still further brought out in the accompanying photographic reproductions.

### THE FALCON DESIGN.

Following the announcement, something like a month ago, that Francis R. Hoyt of Cleveland, O., had been engaged by certain Cleveland men to produce the design for a new cyclecar, comes the statement that the Falcon Cyclecar Company is about to be incorporated in that city with capital of \$250,000. Temporary quarters have been secured at 2344 East 105th street, and it is understood that a factory will be erected on that street, between Quincy and Quebec streets.

The machine, which is shown in an accompanying illustration, bears a very close resemblance in some respects to those produced in France and other sec-

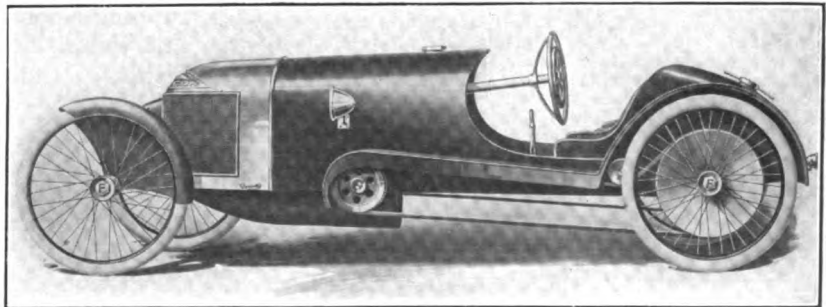
tions of Continental Europe, although the two passengers are seated side by side as is the practise obtaining in Great Britain. However, there are features in the general design and appearance which are entirely new.

The Falcon is equipped with a two-cylinder, air-cooled motor, set forward behind a grating, and beyond the fact that the unit has a piston displacement of 70 cubic inches and is rated at 10 horsepower, no further information is given.

It is stated, however, as one of the special features of the design, that provision is made for starting, or cranking, the engine from the seat, this being one of the functions of the automatic electric lighting and ignition system.

Power is transmitted by a friction transmission, and final drive is by a 1.125-inch white strip V belt. In this connection it is proper to refer to the second feature, which might be considered first in importance. The method of changing speeds is accomplished by a second or auxiliary wheel within the outer steering wheel, this obviating the necessity for reaching for the gear shift lever. Apparently, this design closely imitates the electric gear shift proposition, and, of course, the scheme is to move the driven disc into and out of engagement with the driving disc, as with the usual friction transmission.

The suspension is termed a semi-underslung type, and while the photograph does not disclose the feature, the designer states that the front springs act upon a pivotal principle, in that road shocks are not communicated from the wheels to the body. The general effect is that of a low rakish vehicle, which is still further accentuated by the use of light wire wheels, shod with 28 by three-inch tires. The wheelbase is 96 inches, and the tread 36. The weight of the car complete is 325 pounds. The driver is located at the left.



The Falcon Cyclecar, Indicating Attractive Lines of Its Design.



# IMPROVED ROADS AND MOTORING LAWS.

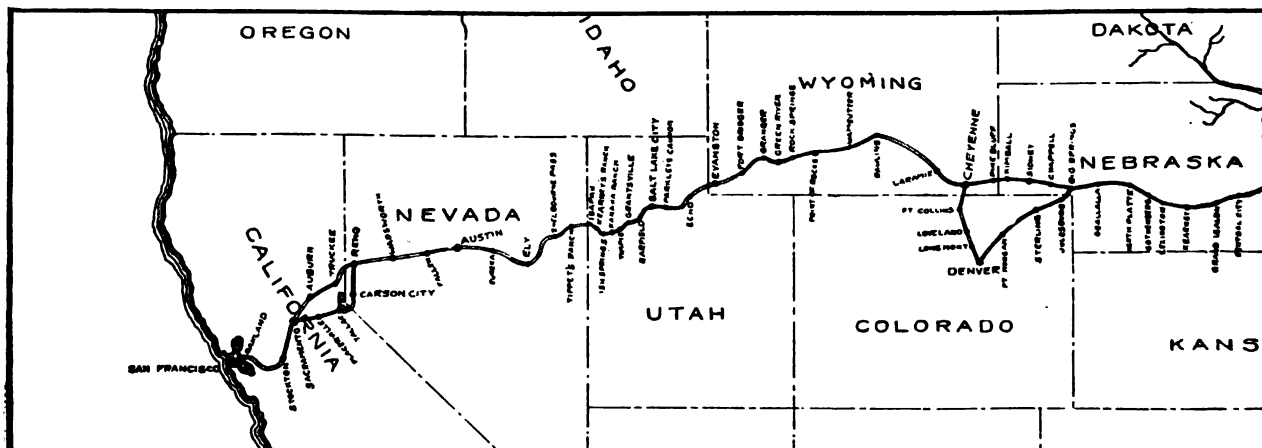
## Lincoln Highway Association Announces Route of Its Proposed Transcontinental Concrete Road--Congress to Consider a New Federal Registration Plan.

AS A result of much study and a careful investigation of the various routes across the country, the Lincoln Highway Association has completed the first step in establishing the transcontinental highway between New York and San Francisco, through the states of New York, New Jersey, Pennsylvania, Ohio, Indiana, Illinois, Iowa, Nebraska, Colorado, Wyoming, Utah, Nevada and California. The official route is designated on an accompanying map, and is still further identified by stating that it shall pass through the following centres:

New York City; Jersey City, Newark, Trenton and Camden, N. J.; Philadelphia, Lancaster, York, Gettysburg, Chambersburg, Bedford, Ligonier, Greensburg, Pittsburg and Beaver Falls, Penn.; Canton, Mansfield, Marion, Kenton, Lima and Van Wert, O.; Fort Wayne,

of the country. Some of the points either on, adjacent to or connected by branch highways are Gettysburg, Penn.; Washington, D. C.; Canton, O., the resting place of President McKinley; the Mammoth Cave of Kentucky; the home of Lincoln in Springfield, Ill.; Lincoln's birthplace in Kentucky; the scenic splendors of Colorado; the Grand Canyon of Colorado, and the many and varied wonders of Utah, Nevada and California. In part the proclamation sets forth the following:

Whereas, our chief step toward the desired goal is to crystallize in the public mind the practical wisdom of the route selected, therefore be it recorded here: First, that in general it has been for nearly a century and is today the main Overland Trail, and that part lying west of Chicago is known by that historic name; second, it is the most direct and most practical route as to grades, curves and general topography; third, it is to the great-



Map Indicating Route of the Lincoln Memorial Highway from New York to San Francisco as Selected by the Lin

Ligonier, Elkhart, South Bend, LaPorte and Valparaiso, Ind.; Chicago Heights, Joliet, Geneva, DeKalb, Rochelle, Ashton, Dixon, Sterling, Morrison and Fulton, Ill.; Clinton, Dewitt, Cedar Rapids, Tama, Marshalltown, State Centre, Ames, Grand Junction, Jefferson, Dennison, Logan and Council Bluffs, Ia.; Omaha, Fremont, Columbus, Central City, Grand Island, Kearney, Lexington, Gothenberg, North Platte, Ogallala, Big Spring, Chappell, Sidney and Kimball, Neb.; Julesburg, Sterling, Fort Morgan, Denver, Longmont, Loveland, Fort Collins, Col.; Pine Bluff, Cheyenne, Laramie, Rawlins, Wamsutter, Point of Rocks, Rock Springs, Green River, Granger, Fort Bridger and Evans, Wyo.; Echo, Parley's Canyon, Salt Lake City, Garfield, Grantsville, Timpkie, Kanaka Ranch, Fish Springs, Kearney's Ranch and Ibapah, Utah; Tippet's Ranch, Shelburne Pass, Ely, Eureka, Austin, Fallon, Wadsworth, Reno and Carson City, Nev.; Truckee, Auburn, Tallac, Placerville, Sacramento, Stockton, Oakland and San Francisco, Cal.

In issuing the statement concerning its decision in this matter, the association explains that its directors have endeavored to select a route of easy grades, yet combining the scenic splendors

est extent improved and marked throughout its length; fourth, it is capable of being established as a fitting memorial highway at the least cost.

It will be remembered that the Lincoln Highway Association was organized for the purpose of building a concrete highway from ocean to ocean. The initial work was undertaken by Carl G. Fisher of Indianapolis, and the association was formed only this last summer. A grand total of \$10,000,000 is to be raised to complete the work. So far as possible, however, it is proposed to utilize existing highways, and wherever state or local authorities desire to build sections of the highway according to the plans and specifications of the association, financial aid will be given beyond that appropriated for the work in question. The announcement of the route is but the beginning



of a greater activity, although it is hoped that a substantial proportion of the road will be constructed before the opening of the Panama-Pacific exposition in 1915.

### MICHIGAN'S HIGHWAY PLAN.

#### Citizens Will Vote on the Question at the General Election in 1914.

Michigan has been pointed out as a striking example of the manner in which so-called state aid has worked to create a highway system which begins nowhere and ends nowhere. In other words, each town or county has been permitted to supervise its construction work without regard for the needs of the whole state, with the result that such improved roads have not been laid out with a definite idea of connecting the entire system. The legislature of 1913 evolved a new plan, which is to be presented to the people for ratification at the general election in November, 1914. The plan is set forth more fully in the following

are indicated by lines drawn through the cities from side to side and end to end of the state, including the upper peninsula.

It is the idea of the promoters of the system to make it an example of thoroughly up-to-date road construction that will be an object lesson to the rest of the country. This will be the effect if the work is carried out as planned, although the primary purpose is to secure the best road system at the least expense for construction and upkeep. In accomplishing this they will be doing what all other parts of the country, and foreign countries as well, should do.

They realize that the only kind of road that is economical in the long run is one that is permanent; that is, one that will not go to pieces or wear unduly under mixed horse and motor vehicle traffic that is rapidly increasing in both number and weight of units. By saving the heavy annual expenditures that other states are making for the repair and resurfacing of water-bound and bituminous macadam roads, they will soon repay the slight excess in first cost of the permanent roads and thereafter have more money for the extension of the system. Instead of becoming an increasing burden for maintenance, every mile of the permanent roads will effect an actual saving in road funds, which will be supplemental to the savings effected by farmers and others in the cost of haulage.

A leaf is to be taken directly from the experience of the board of road commissioners of Wayne county, of which Detroit is the county seat. After building concrete roads for the last five years the Wayne county board has adopted them as standard construction and now builds nothing else. The 65 miles of these roads leading out of Detroit bear the heaviest and most varied traffic of any county roads in the state, yet they have not cost \$100 a year for repairs to the entire system and the oldest



Lincoln Highway Association, Which Proposes to Construct a Concrete Road Surface Throughout the Entire Distance.

communication from H. W. Perry, secretary of the good roads committee of the Automobile Chamber of Commerce, as the national association of automobile manufacturers is known under its present designation:

Michigan is headed directly for first place in the matter of good roads. If the voters and the road commissioners carry out the present programme, she will be the first state in the Union to have a complete trunk line system of permanent highways. The legislature of 1913 authorized a referendum vote on an amendment of the constitution to allow the issuance of bonds to pay for the construction and maintenance of such a system. The citizens will vote on the question at the general election in November, 1914.

A network of main roads connecting all important cities in the state is urged by the Michigan Trunk Line Highway Association, which is engaged in working up sentiment in favor of this great public improvement. The legislature has adopted the proposed system, which is shown by a map of the state on which the proposed roads

and most used roads do not show more than .125 inch wear in the centre. These roads are made of washed gravel pebbles, clean sand and Portland cement, mixed in the proportion of six, three and two parts respectively. They cost from \$1.02 to \$1.45 cents a square yard, or from about \$7000 to \$13,000 a mile, according to width and amount of work required on foundations, drainage, culverts and bridges. These figures include all incidental costs of surveying, administration, etc. While the first cost is somewhat higher than that of first class water-bound macadam roads, it is just about the same as bituminous macadam in which the crushed stone and tar are mixed before laying.

The Wayne county commissioners have had experience with many other kinds of roads, and it was this identical experience with the macadam roads and the excessive cost of keeping them in repair that led the commissioners to experiment with a material of known durability. These permanent roads have given such general satisfaction that they have become famous not only throughout Michigan, but among road authorities all over the United States.

They are a boon to the farmer as well as to the city merchant and manufacturer. Farmers find that they can haul two or three loaded wagons over the dirt, gravel



or macadam roads to the concrete roads and there hitch them together and haul them the rest of the way over the concrete road with a single team, taking the other team or teams back to work in the field. The roads never are muddy or dusty and never have chuck holes. While the Wayne county roads are not more than five years old, there are concrete streets in Bellefontaine, O.; Richmond, Ind., and Chicago that are 21, 17 and 10 years old respectively, and which show very little wear and are apparently good for many more years of use under heavy traffic. In Richmond the cost of maintenance has been nothing; in Bellefontaine it has not exceeded \$150 for half a mile of street in more than a score of years; in Chicago no data on cost of repairs have been collected, but the pavement has worn very well.

If the Wolverines are alive to their opportunity and vote for the amendment that will secure to them a system of permanent trunk roads that will always be in good condition, that will last 50 years or more and cost only about one one-hundredth as much to maintain as the road systems that have been the boast of Massachusetts, Connecticut and New Jersey for the last 10 years, they will have good reason to be congratulated and to feel proud of their accomplishment.

### ROAD CONSTRUCTION METHODS.

#### Automobile Chamber of Commerce Takes Definite Action in the Matter.

The Automobile Chamber of Commerce, the national organization representing some 95 producers of pleasure and commercial vehicles, has taken definite action, through its commercial vehicle committee and the board of directors, concerning road construction methods. The association sets forth, "That we realize thoroughly the necessity of improved conditions \* \* \* and believe it is advisable to adopt the construction that, after thorough investigation, will give the greatest permanency, first cost being of lesser importance," and the resolutions adopted embrace the following declaration of principles:

1. Highway construction is a scientific and engineering problem.
2. Proper location, grading and drainage are first essentials of any good road.
3. Highways should be of a character directly suited to the kinds and volume of traffic using them. It is uneconomical and a waste of time and money to build roads unsuited to the volume and character of traffic and of short durability.
4. Road foundations, culverts, retaining walls and road base should have a durability equal to or exceeding the life of bonds issued to pay for the construction of the roads.
5. When appropriations are made for road improvement, suitable and sufficient provision should be made for maintenance of the improved roads during the life of the bonds issued to pay for them.
6. Volume of traffic and kinds, speed and weights, with loads of vehicles using the roads should be ascertained before beginning the construction of a state road by taking a traffic census, and the rate of increase and change of character should be calculated well into the future.
7. Construction or reconstruction of all main through roads between important trade centres, state capitals and centres of large population (50,000 or more), not more than 100 miles apart, should be of permanent character.
8. Roads which sustain a considerable volume of mixed horse and motor vehicle traffic should have a surface that will not ravel under such traffic, that will not become dusty by wear and the effects of weather, that will be impervious to water and will not be loosened by frost.

9. Until such time as traffic over subsidiary roads and relatively little used country roads warrants improvements with permanent construction they should be maintained in serviceable condition for the traffic using them by relatively inexpensive methods such as dragging, or by the application of gravel, sand, clay, shell, etc.

10. Bridges and culverts should be of sufficient strength to carry the traffic that can be sustained safely by the roads of which they form a part. Pending the rebuilding or strengthening of bridges to such standard, signs announcing their safe capacity should be displayed prominently upon them.

11. Traffic development is an economic necessity and the capacity of roads and bridges should be adequate to the industrial and commercial needs of the communities they serve.

### FEDERAL REGISTRATION AGAIN.

#### Georgia Congressman Introduces Bill for This Purpose in the House.

The subject of federal automobile registration is to be reopened in Congress, the movement having its origin in the South this time. One of the arguments against the proposition when it was considered before found its basis in the doctrine of state rights. The text of the new bill, introduced by Congressman Adamson of Georgia, is as follows:

To regulate the interstate use of automobiles and all self-propelled vehicles which use the public highways in interstate commerce.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That until further provision is made by Congress, the use and operation of all automobiles and all self-propelled vehicles using the public highways in interstate commerce shall be regulated in conformity with existing laws of the states, territories or districts, respectively, wherein the owners and operators of such vehicles may reside, or with such laws as may hereafter be enacted for such states, territories or districts, respectively, for the purpose, with this following qualification: No person who shall have qualified by complying with the laws and regulations of the state, territory or district of his residence to use and operate such vehicle or vehicles shall be required in any other state or territory or district into which he may go for business or pleasure to make any additional registration or take out any additional license in order to use and operate any such machine. The certificate of the proper local officers shall be taken and accepted in all states, territories and districts as competent and sufficient evidence that such person has complied with the laws and regulations of the state, territory or district of his residence, but nothing herein contained shall be construed to exempt any person from the police regulations of any state, territory or district into which he may go, save only the additional registration and the taking out additional license in case he shall have complied with the laws and regulations of his own state, territory or district.

Section 2. That all laws and parts of laws in conflict herewith are hereby repealed.

The Norwich Chauffeurs' Club has been organized in Norwich, Conn., with the following officers: President, James H. Craney; vice president, Edward Harper; treasurer, James P. Sheridan. The club has established permanent quarters in the Carpenter block, and has a charter membership of 50.



## CORRESPONDENCE WITH THE READER.

**Dish of Ford Car Wheels.**

(1647)—Why is it that the front wheels of my model T Ford car are dished? I do not notice this feature in other cars.

W. H. H.

Providence, R. I., Sept. 11.

The Ford Motor Company explains its reasons for the construction in its publication, the Ford Times, and the illustration presented at Fig. 1 shows the principle involved, it being held by the company that the nearer to an alignment the centre of the spindle bolt and the pivot point of the wheel are when turning, the easier the car will steer. If it were possible to bring the centre of that part of the tire which is upon the ground to a point exactly under the joint of the steering knuckle, the arrangement would be ideal. To secure this alignment, or as nearly as possible, the wheel is dished.

A plumb line dropped through the centre of the spindle bolt would strike the ground just 2.0625 inches from the pivot point of the wheel. To the nearness of the two points is attributed the easy steering qualities of the machine.

**Alcohol as a Fuel.**

(1648)—What would be necessary in order to use denatured alcohol as a fuel instead of gasoline? Could the two be mixed? Alcohol is rated as a carbon remover.

C. A. F.

Providence, R. I., Sept. 10.

A special carburetor or one so modified as to permit of its use would be necessary. There are disadvantages besides the high price of alcohol which prevent its adoption with conventional forms of motors and carbureting devices. The most important of these is thermal or heat efficiency. This is a vital factor, when alcohol is to be used in appliances designed for the use of gasoline. This disparity in heat value means that it will be approximately twice as costly as gasoline, allowing that both were sold for the same price a gallon. Weight for weight, the heating value is but .6 that of gasoline, and according to experiments carried out by Prof. Lucke of Columbia it has been determined that all other factors being equal, a small engine will require 1.8 times as much alcohol as gasoline a horsepower-hour. Another disadvantage is that it has a higher vaporizing point than gasoline and a special modification of the carburetor is essential to secure complete vaporization of the alcohol and maximum efficiency. A third disadvantage is that it is easy to burn an excess of alcohol without detecting it; much more so than with gasoline.

If other conditions are considered, however,

the two fuels become more at a parity. Alcohol vapor can be compressed to a higher degree than gasoline vapor before it will ignite prematurely. This fact tends to balance the discrepancy between the relative heating values and while alcohol contains less heating units its thermal efficiency is greater. The thermal efficiency means the degree of utilizing all of the heating value of any combustible, and as the thermal efficiency is greater with a gas as the degree of compression is possible before ignition is increased, it will be seen that the quality of alcohol to stand a higher degree of compression compensates for the difference in the amount of heat units a pound of fuel.

In an engine designed to use alcohol and with proper vaporizer or carburetor, alcohol will develop as much power a pound as gasoline working under its best conditions.

Less air is required to burn alcohol and there is practically no residue left in the engine, because no carbon is left free or in an uncombined state.

Relative to the mixing of alcohol with gasoline and utilizing it as a fuel, it would not be practical because of the characteristics of the two liquids, difference in specific gravity, etc. The simple experiment of trying to mix the two will demonstrate the points involved.

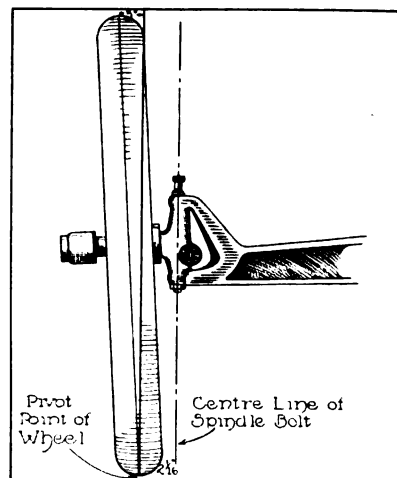


Fig. 1—Illustrating Dish of Front Wheels of Model T Ford.

**Function of Ammeter.**

(1649)—In a recent issue I noted a description of an ammeter among the accessories described. I understand their service with dry cells but believed that only a voltmeter could be employed with storage batteries. I also note that the lighting systems on cars nowadays have an ammeter. How is it used and why can it be used?

J. A. S.

San Diego, Cal., Sept. 8.

The ammeter utilized in connection with the electric lighting systems indicates at all times the amount of current being produced by the generator or discharged from the battery. One



of these, a Hoyt, made by the Hoyt Electrical Instrument Works, Penacook, N. H., is shown at Fig. 2, and it will be noted that normally the indicating hand rests at zero.



Fig. 2—Lighting Ammeter.

When the needle points to the left of the zero point on the scale it denotes that the cells are supplying electricity to the lights, or discharging, the amount of current being indicated by the point at which the needle rests. For example: If eight amperes are being drawn from the battery, the hand would point at the figure 8.

When the needle swings to the right it shows that the generator is charging the cells and the amount of current passing is indicated. The ammeter is a tell tale in this respect. It does not, however, show the amount of current in the battery. There is no instrument made which will show this. The voltmeter referred to indicates the voltage or strength of the current, not the quantity.

#### Dual Independent Ignition.

(1650)—Am rebuilding a touring car into a roadster and desire some information as to installing a magneto. The motor is of the L head type and has but one set of spark plugs. The ignition at present is a battery and a four-cylinder coil. I wish to eliminate the coil, fitting a distributor in place of the timer, and employ but a single unit. I wish to install a magneto, a true high-tension. How could it be arranged so as to employ one set of plugs, or would it be better to employ the exhaust valve caps for the second set? INFORMATION.

Galesburg, Ill., Sept. 14.

The exhaust valve caps could be altered to take one set of the plugs, depending upon design and thickness of the material. The disadvantage of the plan is that with these caps utilized for the battery spark plugs their points are exposed to more or less sooting and heating effects because they are in the path of the exhaust gases and are not cleaned by the incoming mixture as when located in the intake caps.

By using double spark plugs as shown at Fig. 3, the regular spark plug positions could be utilized. These plugs may be obtained at any large supply house, and permit of using either circuit as desired. The wiring plan is also shown in the drawing and although but one switch, that employed with the magneto is shown, a second member would be needed for the battery circuit.

#### Clashing of Gears.

(1651)—Having made my first investment in a motor car, a second hand one, I find that after considerable driv-

ing I am unable to shift the gears in the transmission without a good deal of noise and accompanying trouble. The clutch is a cone. I am advised that the fault is not mine, but that of the design and natural wear. In my opinion the gears are not going to last forever and I wish to know if there is an inexpensive method of curing the trouble. Noting that you give advice to your readers, and being a subscriber, I am taking advantage of the opportunity for obtaining information.

NEW SUBSCRIBER.

Rochester, N. Y., Sept. 17.

It is possible that the design is such that the inertia of the flywheel is not overcome or that the clutch bushing or bearing is so worn that the clutch drops down on the spindle. This last named condition would cause the periphery of the male member to bear against the female (flywheel) member even when the clutch pedal is fully depressed. The contact may be slight, but enough friction will be set up to cause the female portion to impart motion to the cone member.

In order to effect silent meshing, the pinions to be engaged must rotate at approximately the same speed, and if one be turning faster than the other, the slower member must be brought up to the same number of revolutions as the other, or vice versa. This is usually accomplished by decreasing or increasing, as the case may be, the speed of the motor which imparts energy to the female portion of the clutch, thence through the male member and shaft to the constant mesh gears of the transmission.

The bushing of the clutch should be inspected, also the clutch (male) examined for spinning after it has been withdrawn and with the motor operating. If the clutch fails to come to a complete stop it will denote that it is dragging and the fault should be corrected without delay.

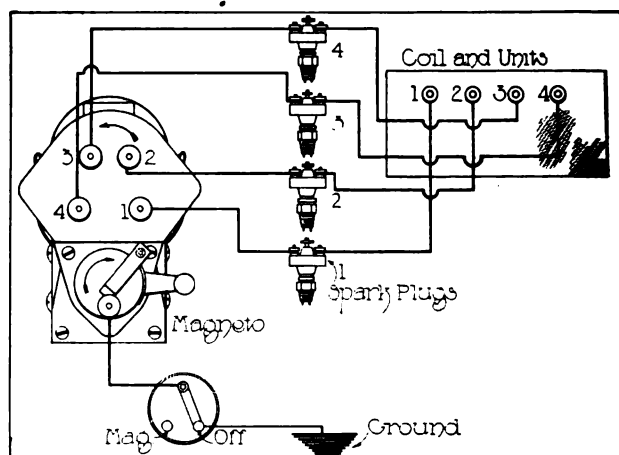


Fig. 3—Wiring Plan for Two Independent Ignition Systems with Single Set of Spark Plugs.

If the clutch comes to a stop the examination must be continued to the gearbox, which should be emptied and cleaned. The shaft bearings may



be worn so badly that the gears will not mesh easily. This may be noted by changing speeds.

With the clutch operating properly and the transmission bearings in order, it may be assumed that the fault is because of the design. The best and simplest repair is to fit a clutch stop, a device which is employed on modern cars and which is of value in that quick and quiet changes of gears may be made without the clashing referred to. The object of the stop is to retard partially or wholly the spinning of the clutch shaft and enable the operator to change up or down, as the case may be, without grinding of the pinions in the gearbox.

Two forms are shown at Fig. 4, that at the left being adaptable to a cone clutch and suitable to a car having a cross member upon which the device is mounted. It consists of a five-inch round metal rod which is threaded at one end, and fitted with a wooden block having a leather facing at the other extremity. To the cross frame is bolted a T piece and the latter is threaded to take the rod, which is held securely by lock nuts. This arrangement makes for adjustment as well as for wear.

Where the design is such that it cannot be placed upon a cross member or on the gearbox, the sub-frame may be utilized as shown at the right of the sketch. A plate is bolted to the frame and the former drilled to take two bolts, these being employed to lock the stop proper. The latter is constructed of spring steel and slotted to permit of adjustment for position, as well as wear of the leather pad. In setting the device the clutch is thrown out, the stop moved forward until it comes in contact with the periphery of the clutch and the bolt locked. In adjusting these devices it should be borne in mind that they should not be so set that a harsh engagement will follow. Their object is to slow down the spinning member to the required speed for meshing the gears, not for stopping the clutch entirely. It will require but a short time to learn the "feel" and if properly adjusted and operated will make changing up or down an easy matter and eliminate the grinding noise. The material required is not expensive.

#### Efficiency.

(1652)—In reading your magazine I notice the word efficiency is employed considerably in mechanical articles. What is the definition of the word as implied in the articles?

Niagara Falls, N. Y., Sept. 20

CURIOUS.

Efficiency is defined in engineering as the quotient "output" divided by "input"; that is, the energy utilized divided by the energy expended. The difference between the input and the output is the loss or waste of energy. Expressed as a fraction, efficiency is nearly always less than unity. Expressed as a per cent., it is this fraction multiplied by 100. Thus it may be said that a motor has an efficiency of .9 or of 90 per cent.

#### AFTERMATH OF THE TOUR.

##### Haynes Automobile Company Reports the Sale of 247 Cars as One Result.

When the recent Indiana-Pacific tour of the Indiana Automobile Manufacturers' Association was first projected it was anticipated that it would prove of decided value in securing new

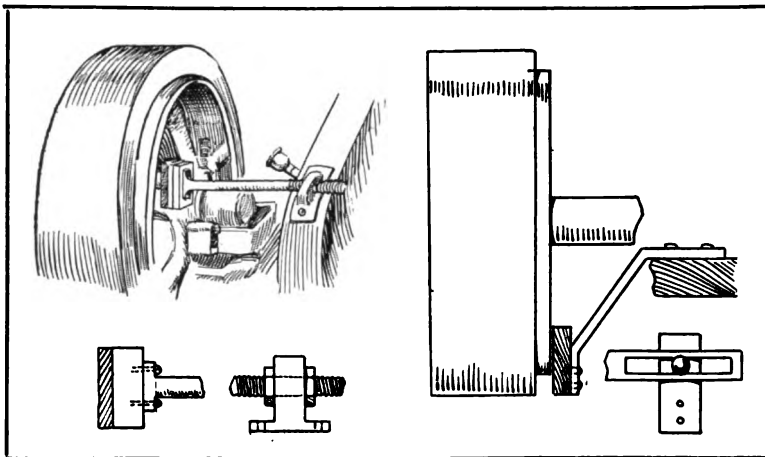


Fig. 4—Construction and Fitting of Clutch Stops to Prevent Undue Spinning of Clutch Shaft.

business in the territory visited. The results have been quite sufficient to indicate that this view of the proposition was correct.

The Haynes Automobile Company, Kokomo, Ind., which had two Haynes cars, Nos. 12 and 13, in the tour, reports the sale of 247 machines as a direct result of the tour. The orders were collected as follows: Kansas City, 125; Salt Lake City, 50; Ely, Nev., 10, and Corning, Cal., 10. In addition to these wholesale orders from dealers, immediately after the tour was concluded Sales Manager George H. Strout received the following telegram from Gov. George H. Hodges of Kansas:

Enter my order two six-cylinder, five-passenger Haynes cars, equipped with mechanical tire pump.

Charles Terres Weymann has declined his appointment as representative of the United States in the fifth race for the Gordon-Bennett cup.



## CHARACTERISTICS OF HEAVY FUELS.

### Part III—Conditions Resulting from Varied Speed Coupled with Throttle Control When Carbureting Kerosene in a Gasoline Motor.

IN THE previous installment it was shown that variation in the speed of the four-cycle gasoline automobile engine was obtained by quantity regulation of the fuel, and that the air supply was so controlled as to provide practically the same mixture at all speeds. The effects of these variables were also outlined. The immediate result of varying load in the automobile engine utilizing heavy fuels is varying speed, the ultimate outcome of which is many headed, including as it does variation of air influx and in compression temperatures. Varying the density of the charge drawn in by the suction stroke of the engine raises or lowers the pressure of compression, therefore the heat of the compressed charge varies correspondingly. The effects of varying air

The same authority holds that it is difficult to get a small auto spraying engine to run both slowly and regularly, and that any heavy fuel carburetor will demonstrate this, in that the smoke grows persistently worse. The diagrams at Figs. 11 and 12 illustrate action of heavy fuel engines under overload, representing in one case an engine on overload and in the other, starting from all cold. The curves are approximate sketches only. A is the overload, B the speed, C the compression temperature, D the value of the vaporization resultant from compression heat, E the character of the spray, F the internal cylinder condensation and wall action.

#### Result of Overload.

Fig. 11 shows an engine that has been running on regular load subjected to an increasing resistance as indicated by the curve A, which would bring the machine to a standstill at ordinate L. The curves show the speed B falling with the increase of load, the temperature of compression also falling with the load, and similarly a degeneration in the quality of the spray E, while the condensation F increases as the speed falls. The engine is fitted with a float feed, but has a constant area of air inlet to the fuel spraying jet. It is assumed that if the action of the engine could be maintained over the peak of the load indicated, it would continue to operate satisfactorily under a normal load. Under the conditions presented, the spray has degenerated greatly as to quality. If this were remedied at the ordinate M, it is probable the engine at reduced speed would surmount the peak.

#### Effect of Air.

In the early types of marine engines having a small air spraying orifice and a separate hand controlled air inlet, if the machine showed signs of stopping, the extra air was cut off. The speed would then pick up and, ignoring the load curve, the state of things in the cylinder was similar to the amended curves as indicated in dotted line. The rise of the speed curve B<sup>2</sup>, the sustention of the compression line at C<sup>2</sup> and the internal vaporization D<sup>2</sup>, and the lessening of internal condensation F<sup>2</sup>, followed up by the improvement in spraying power and spray quality E<sup>2</sup> upon the increased air blast of the fuel spraying jet, is resultant upon shutting off the main air at the point

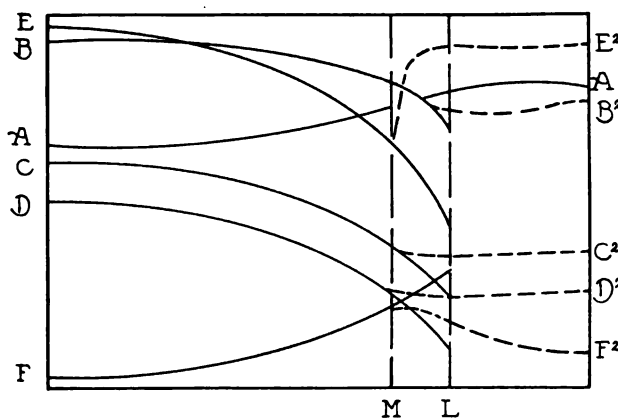


Fig. 11—Showing Engine Operation on Regular Load Subjected to an Increasing Resistance as Indicated by Curve A, Which Would Bring the Machine at a Standstill at Ordinate L.

flow in intake pipes was illustrated diagrammatically at Fig. 2.

An English engineer, who is an authority on engines and who has experimented to a considerable extent with heavy fuels, states that a very little consideration will convince the designer that the varying character of the spray—that is, variation in the degree of fineness to which the fuel is broken up—is a great evil and must receive attention in any endeavor to perfect an auto spraying engine. Degeneration in the character of the oil spray attends reduced piston velocity, so that unless the variable speed oil engine designer recognizes this, he is likely to go astray in planning.



M. It would appear that the re-establishment of a high velocity past the fuel jet saved the engine.

Fig. 12, lettered as Fig. 11, represents starting

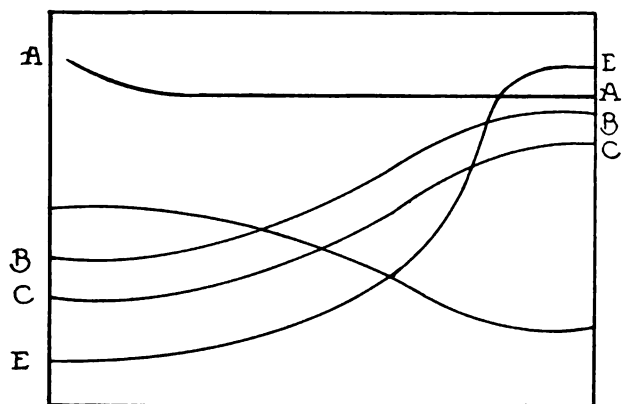


Fig. 12—Representing Starting an Engine from All Cold and Gradually Lessening Condensation Until It Becomes a Constant.

an engine from all cold with the enormous condensation which gradually lessens until it becomes a constant. Compression temperature and its effect on the charge rise with the speed, and the character of the spray improves rapidly. In internal combustion gasoline engines high speed favors results.

One authority on heavy fuel motors holds that all kerosene engines tend to knock when their speed falls because of too high a gear, that is, when it is necessary to change to a lower gear; that degeneration of the fuel spray may result in the varying changes of control, but the class that least shows the tendency is that where direct vaporization is the basis of the feed preparation cycle. This is in accord with the theory which ascribes oil engine bumping to the presence of liquid fuel in the cylinder as distinct—that is to say, from vapor.

#### Value of Compression.

Varied speed from varied load, coupled with throttle control, results in a number of conditions, difficult to schedule, but one factor may be considered. Under the effect of charge variation by throttle valve the value of compression must needs vary widely. Assuming a throttled engine at high speed to have a certain volumetric efficiency, such efficiency is considerably lessened when running slowly with the throttle open, when practically a full charge enters the cylinder.

In variable speed oil engines controlled by the throttle the value of compression varies, for example, from a maximum to .25 thereof. The engine charge has, therefore, to withstand the effect such a variable factor may exert upon the combustion cycle. The heat of compression can ef-

fect vaporization, but as the compression is variable so also is the heat; so also must the amount of combustible vary for, sensitive to this heat, the charge condition must be affected, and more or less vapor must be added or deducted at the end of compression. In other words, varying load resulting in varied speed, varies compression, which varies internal cylinder heat, causing a variation in the amount of combustible, and if this should not apply under all running conditions it must do so at such times as varying air velocity in the intake pipes causes a degeneration in the spray character.

The times when troublesome exhaust may be looked for from a gasoline engine with kerosene carburetor are: First, at overload, or when the load increases beyond that well within the engine's capacity, and the speed in consequence falls; second, when it is endeavored to run the engine slowly, as when car is standing still; third, when control requires rapid changes of gear accompanied by sudden and irregular engaging and disengaging of the clutch.

In the first and second conditions it may be assumed that there is degeneration in spray quality, but there are other factors, for in the one case (overload) the throttle will be open; in the other it will necessarily be closed, and under the latter conditions full compression cannot be expected. The penultimate efforts of engine action in both cases are characterized by the discharge of offensive odor, popping in the intake, etc., all as the result of imperfect aeration; missing fire and engine charge impoverization by reason of the failure of normal medium for rendering such amenable to the combustion process. These conditions are simple, relatively at any rate to the third

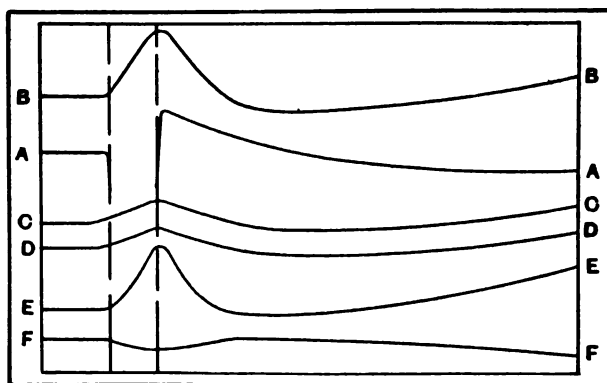


Fig. 13—Engine Without Throttle Control, and Effects of Disengaging and Engaging the Clutch, Etc.

state, where the engine is alternately relieved of load and put under temporary overload, all under many varying conditions.



The act of accelerating before engaging the clutch; the slowing of piston speed on clutching; the freedom at one moment from all load on dis-

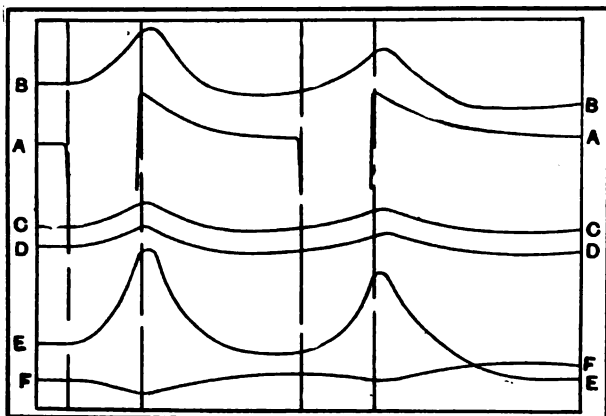


Fig. 14—Showing Effects of Starting of Heavy Car from Standstill on Engine Action.

engaging the clutch and the instant subvening of that which, but for stored flywheel energy, would be a real overload; the speeding up of the engine as it warms to its work, all under the influence of a throttle that varies, not only in induction on charging stroke, but also the compression temperature curve; the effects further subvening of a varying condensation factor in the cylinder, are some of the results of engine control to meet varied load, while accepting concomitant varied speed. This running condition shows up clearly the difficulties in designing heavy fuel carbureting appliances. Could constant fuel spraying be assured at all speeds, the slow speed overloaded and the slow running underloaded, engine condition could be improved greatly, for the effect of varying compression temperatures is less noted when the engine charge is of a high class, which is where the combustible is finely triturated, thoroughly vaporized and has oxygen well disseminated among the individual clusters of hydrocarbons. The result of such a condition is what may be termed high carburetion. In such a state the fuel particles have aerial envelopes, and in this condition the explosive charge best withstands compression resists; that is to say, the tendency to condense when the temperature of compression falls, so that fine fuel spraying, unless seconded by complete vaporization, may fail to show its full benefit.

In the third condition, that of quickly disengaging the clutch to the maximum of acceleration, as in gear changing, a degenerate mixture must ascend, differentially, to a more refined state, therefore the act of disengaging the clutch is to increase the amount of combustible suit-

able for combustion. Practically, such a condition enriches the mixture, for not only is there the factor of increased feed from increased air velocity, but also an increase in the factor of combustibility, for the increase in piston speed has added to the vapor forming and vapor maintaining power of rising compression temperature. The effect of disengaging the clutch should be to enrich the mixture charge, and the smoking effect would be noted in the exhaust, as may be seen in practise.

#### Air and Fuel Proportions.

Formerly it was held that the proportion of fuel to air was the factor requiring attention in kerosene engines adaptable to automobiles. R. Owen Allsop, an English authority on heavy fuel engines, states:

Important as is the question of reasonable proportioning of the element and a fair state of carburetion, even a coarse spraying engine may be made, on regular load, to give a reasonable exhaust. If we accept this, which anyone may test for himself, and which, as far as the writer is concerned, has been carefully ascertained, there must be other causes prejudicing combustion. For if it is possible, as can be demonstrated, to run an oil engine under constant load, maintaining a constant fuel supply and yet be able to play with the air inlet from a maximum say to one-fourth thereof, plainly the state of the art is that the question of mixture, as such, is solved; and if mixture qua mixture is not the cause of oil engine exhaust—where a high state of carburetion pertains—then some other cause is at work. To take a note of the obvious, nothing is so grossly apparent as that varied speed varies air velocity in induction pipes, and it needs no explanation that the quality of or the fineness of the spray is a measure of the vigor of air blast directed against the fuel jet. Then, obviously again, the act of varied air rush alters the size of the fuel spray globules.

Imagine a steam boiler furnace fed in some way with coal, and that there is an endless belt feeding the fuel into the furnace. The internal effect of varying piston speed in oil engines having auto spraying by motor piston is as though we at one time passed small coal along the feeding belt, and at another moment neglected to break the coal, while occasionally allowing massive

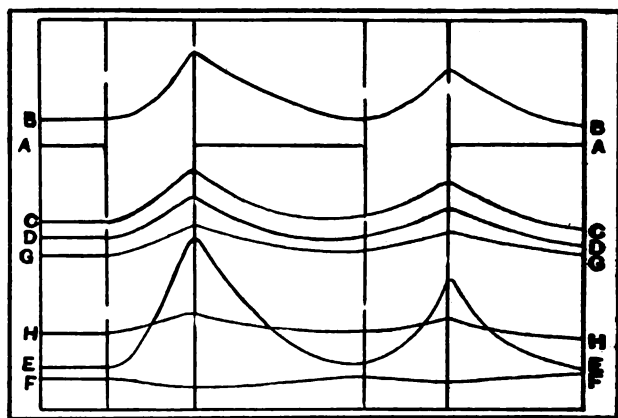


Fig. 15—Illustrating Conditions Taking Place on Two Clumsily Performed Disengagements of Clutch with Car on Level.

lumps to pass to the furnace. Combustion results here would be hopeless and we might as reasonably expect a locomotive driver to be on time if his fireman fed in coal of widely different size as that an oil engine should



show constant combustion results where at one time the feed is a true mist, at another a gross spray, and yet again, accompanied at intervals by coarse oil drops, so proof against compression heat and even the fiery ordeal

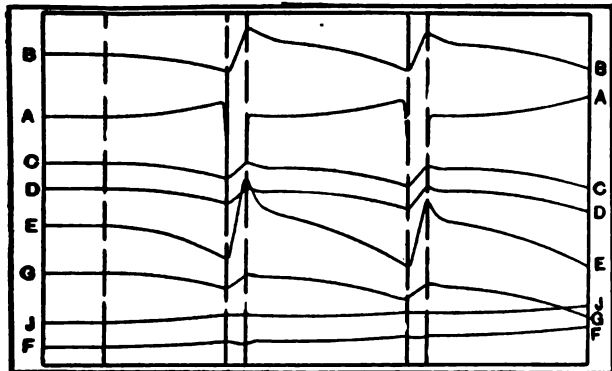


Fig. 16—Effect of Two Gear Changes with Car Climbing a Steadily Increasing Gradient.

of the full blast of combustion that they pass out of the exhaust still as individual units, even if greatly reduced in size. This seems the point for inventors. Unless grasped, the efforts at constant mixture making are futile, for where the gasoline carburetor designer has progressed his heavy fuel confrere has great leeway to make up.

#### Effect of Varying Conditions.

The drawings (Figs. 13, 14, 15, 16 and 17) are sketch diagrams co-ordinating load, speed and various conditions on motor car engine running and control. The curves are approximations only, and without basic zero or scale. The ordinates indicate position of disengaging and engaging the clutch. The reader is cautioned against attaching any significance or import to curve details, the diagrams being utilized to explain the points involved. In all diagrams, A is the load—that is, the resistance against which the prime mover operates; B, the piston speed—the average of such speed; C, the temperature of compression; D, the amount of internal vaporization resulting from adiabatic air compression—the value of the compression heat in completing vaporization commenced in the external vaporizer or in initiating vaporization from fine spray. It stands for the effect of compression on the quality of the engine charge. E is the spray character—that is, the fineness (positive) and the coarseness (negative); F is the factor of wall action—the internal condensation cast upon the engine surfaces. Added in Fig. 15 are G, the vaporizer temperature, or, more correctly, the value of the heat going to the vaporizer, and H, the amount of fuel sprayed. Added to Fig. 16 is J, the amount of heat going to the water jacket.

#### Action of Unthrottled Engine.

The engine is assumed to be an out-of-date type; has a constant air inlet orifice at the gasoline spraying jet, a float feed and an auto extra air inlet valve, but no device such as rising air valves in the main air entry and no taper needle in the jet. It is four-cycle, and a two-cylinder, so that rapid acceleration is advisable on engaging the clutch. It differs from the conventional four-cylinder motor in this respect. Modern devices will improve results, but their introduction here would considerably complicate causes and involve effects.

Fig. 13 therefore represents an engine without throttle control and running on a steady load. The clutch is disengaged as indicated by the curve, and on re-engaging the clutch a starting effort is exerted, after which it tends to accelerate. It races, but is slowed up by the clutch. The compression temperature rises with the speed, the extra heat generated by the increased compression enables the air better to hold up vapor and gives more power for generating additional vapor from fine spray. The spray character improves rapidly and greatly with increase of piston speed; as a result of this improvement, plus the higher piston velocity, the wall action decreases. All conditions are reversed on engaging the clutch, but as the engine picks up, so again the internal cylinder conditions increasingly favor good combustion.

#### Results of Clutch Action.

Under the arrangements assumed and having a satisfactory state of things before disengaging the clutch, visible exhaust may be anticipated both before and after use of the clutch. If the feed were wet, that is, if much spray were carried into the cylinders before disengaging the clutch, although the increased piston velocity greatly favors good combustion, the rhythmic harmony of engine action becomes disturbed. The mixture before assumed satisfactory, alters for reasons long accredited by gasoline carburetor designers, but also, in the case of heavy fuel, because the rise in compression temperature alters the value of the coefficient for internal vaporization. Modern devices can ameliorate the evils considerably, but the trouble upon engaging the clutch is more pronounced for, on top of the disorganization from racing, comes that attendant upon rapidly falling piston velocity. Here smoky exhaust may be expected since, for one thing, wall action—internal condensation, in other words—persists in its effect; so that a badly smoking engine exhaust pipe is probable at the lowest engine speed that will only gradually clear as the speed increases and a regular load comes upon the engine.

If, immediately after a change of gears, the clutch is disengaged and engaged a second time, the effects are magnified. The disturbance to engine action is compounded, the effects following the second change being the sum of the two changes. Such a condition of affairs is indicated in the diagram at Fig. 14, which assumes an unthrottled engine on a motor vehicle in such circumstances that an appreciable starting effort is made, and where a heavy car is brought to a standstill and restarts on engaging the clutch.

Sufficient time after the first change has not elapsed to recover rhythmic running, and inferior acceleration may be expected in the second change for, besides the general disorder, the persistence of internal condensation effects are superadded; that is, wall action increases. Bad exhaust conditions are to be anticipated following the second change.

Fig. 15 represents two slow, clumsily performed disengagements of the clutch on the level, with an unthrottled racing engine, the car being under way, and much the same effects result. If the curve G be added, the vaporizer temperature, if the vaporizer walls be sensitive, and H, the amount of fuel sprayed, the one increases by value of the heat cast out of the racing engine, and the other by reason of the negative pressure above the jet, while the spray character improves considerably on the increase of piston velocity. Each condition would favor oil engine combustion were the spraying constant in character and amount, but under the conditions supposed, these upset mixture, both as to quality and quantity, so that exhaust results attending the previous example may be expected.

#### Effect of Steadily Increasing Load.

Diagram Fig. 16 represents a car climbing a steadily increasing gradient, the gear lowered in two changes, and an unthrottled engine that races on disengaging the clutch. The resistance against which the engine works increases before the change and the speed falls before each change. All conditions become worse as the speed

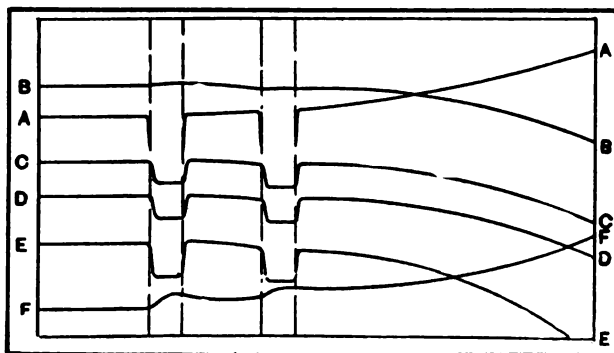


Fig. 17—Conditions Imposed by Use of Throttle Control, Preventing Racing of Engine.

falls and prior to the changes knocking is not unlikely. The amount of heat going to the water jacket increases with the load, and the action increases with the fall of speed. Bad exhaust is certain on gear changing and im-



mediately preceding it, for the work approaches a real overload and all conditions are at their worst. Should the engine become overheated its action would be disorganized completely. All factors favor pre-ignition be-

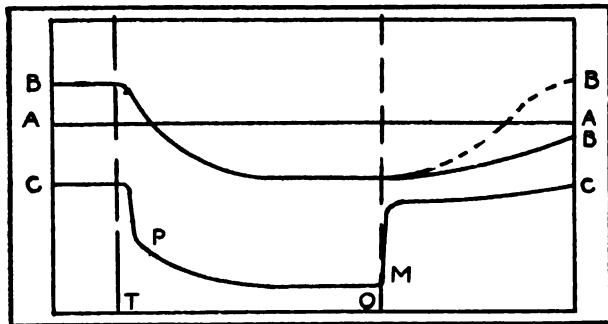


Fig. 18—Motor with Even Load, Throttled at T and Opened up at O, the Situation Indicating Throttle Control for Speed.

fore the gear is changed, all conditions bringing about a state of engine charge characterized by the presence of liquid fuel in place of suitably combustible vapor. Racing an engine under these conditions greatly improves the condition of things within the cylinder. The isolated ordinate indicates the change from harmonious, constant load condition.

The act of throttling the assumed engine introduces new conditions. Fig. 17 indicates the engine relieved from load and prevented from racing by a throttle. The load increases to a critical amount, the heat of compression drops away instantly on closing the throttle; the curve on internal vaporization consequently follows; the spray character degenerates, and the wall action has been shown as increasing, not by reason of the lowered compression which may be rather expected to act the other way, but because the feed becomes coarse; all conditions act against the engine, tend to upset proportion of mixture, introduce spray into the charge, and may be expected to cause smoky exhaust. The condition would appear to be remedied by the opening of the throttle, but wall action—condensation—will have acted prejudicially.

#### Action Resultant on Throttling.

Fig. 18 is indicative of an engine on an even load, throttled at T and opened up at O. The situation indicated is throttle control for speed. The piston speed falls and maintains its lower limit until the charge is again admitted freely. It might be imagined that the opening of the valve would re-establish former conditions. It will, however, be noticed that this is not so. The curve C is a certain level at P, but it is lower at M. If the preceding condition were re-established these points would be on the same abscissa. The curve is the temperature of compression and is correlated necessarily to the internal combustion factor. It falls suddenly at the closing of the throttle, but, since this affects speed, as this lessens, the compression temperature is further reduced until it falls to that corresponding to the temperature associated with the speed during throttled running. The opening of the throttle, therefore, is at lowest compression temperature and lowest speed. Bearing this in mind, and that all conditions during throttling are adverse, even neglecting the mixture charge—its altered proportion of fuel and air—some information is obtained respecting kerosene engine acceleration, or want of such, and need not express less surprise that, whereas it was desired to accelerate as the dotted line B in Fig. 18, in practice it will be more as indicated by the curve B. The same conditions apply in gasoline engines, but the acceleration of these is satisfactory because gasoline is volatile and non-sensitive to the inconstancy of compression temperature; it readily turns into vapor, which holds up in the cylinder in spite of the reduced heat in the air.

No doubt the same effects pertain, in their degree, and where superfine inquiry has been applied to such engine carburetor investigations and design, perhaps many of the resultant conclusions would require modification if the point respecting compression heat were duly considered. In heavy fuel engines for variable speed duty rapid acceleration is a desideratum. It can only be obtained

by more refined carburetion, and this can only result from improving spray quality.

#### Variation in Compression Temperature.

Considering the diagrams in general, it will appear that a variation in compression temperature is a formidable evil where a condensible fuel is employed. In Fig. 19 are four diagrammatic compression lines. A represents full volumetric efficiency as the result of a wide open throttle valve; B, the condition attending partial closing of the throttle; C, half throttle, and D, a maximum of throttling. It might be said that the lines O A, O B, O C and O D represent proportionate amounts of fuel in a fit state for combustion; not that which may be burned in some sort of fashion, but that which is in a state suitable for and including perfect oxidation. If a very gross feed is assumed—a wet vapor characterized by heavy spray—as contradistinguished from that which is fine by reason of effective pulverization and complete external vaporization in the vaporizer proper, these varied heats of compression must greatly alter the quality of the explosive charge, although the amount of combustible entering the engine on intake stroke is correctly measured and constant. The total amount of combustible, in a fit state for combustion, present in the cylinder at the time of ignition, will be that resulting from the effect of adiabatic air compression plus external vaporization. It will be the sum of the combined work of the two agencies. Refinements in fuel pulverizing devices must greatly lessen the trouble here indicated, where both agents are liable to variable efficiency, for, given more constancy in the spray character and that character of a high class, a lower compression heat will suffice to complete vaporization while a higher heat will not greatly disturb actual and suitable internal conditions.

#### Defects of Throttle Control.

Assume that the card is taken from a light running engine at high speed at A, and a lower speed at B, as the piston speed falls with a coarse feed an increase of smoke in the exhaust may be expected, to a maximum of such as compression D. Moreover, assuming the feed correctly proportioned at A, and the throttle producing state D, the mixture will be greatly impoverished and the engine prone to misfire. This is but part of the trouble. If the velocity of the air past the spraying jet has decreased, contemporary with the falling in compression temperature, the spray will degenerate in character, and such a condition, under heavy load, may be followed by cessation of engine action. Again, if compression B obtains a result of internal and exterior vaporizer action, a correct proportion of air to a perfectly prepared combustible, A will see an excess, C, a deficiency. Throttle control, then, disorganizes at least three ways. It upsets mixture, as is by this time well known; it alters the character of the mixture, and alters the amount of read-

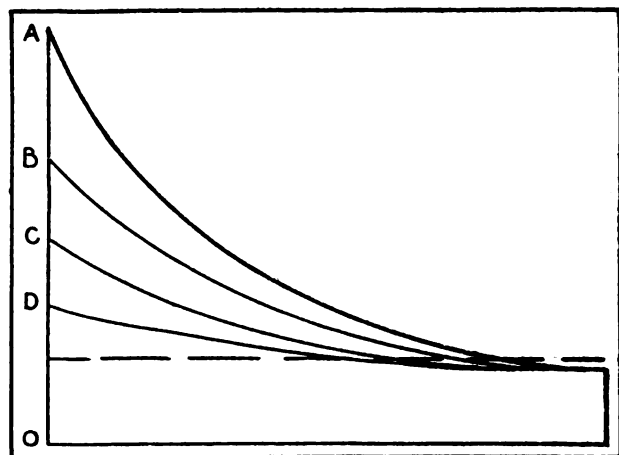


Fig. 19—Diagrammatic Compression Lines Representing Various Positions of the Throttle Valve from Maximum to Practically Closed.

ily combustible fuel present in the cylinder at the firing point.

Furthermore, taking the state of the compression line B, and regular running, the deposition of condensed



fuel upon the cylinder walls is constant; so much will be deposited on the intake and compression strokes, so much, possibly, regenerated, as vapor on the firing and exhaust strokes, but this rhythmic action is all destroyed immediately the position of the throttle is varied. Regular combustion is upset, and visible exhaust is the evidence. The factors, therefore, influencing combustion are: First, the amount of fuel sprayed; second, the character of the spray; third, the temperature of the vaporizer; fourth, the temperature of compression; fifth, the internal condensation, and six, the same factor reacting with cold walls.

These several conditions throw some light on the causes of difficulty in maintaining a clear exhaust in variable speed oil engines, where, as in engaging and disengaging the clutch, and gear changing, throttle control is varied, or the engine uncontrolled races. And, as respecting heat of compression, it should be duly noted how the variable factor concerns not only compression under each definite charge constant, but also under each such charge volume compressed at varying speed. The amount of combustible, therefore, varies differently in two orders, which, in combination, make a practically infinite variation in the quality of the explosive charge.

#### Thermodynamic Losses.

Not only does the actual amount of the combustible vary as stated, but the variation in the mixture as externally prepared and supplied to the cylinder varies the compression curve. It has been long known that the temperature attained by the sudden compression of pure air considerably exceeds that of a mixture of gasoline, air and combustible products. The lowering of the curve is a measure of the work done upon liquids and vapors, and, so far as concerns vaporization, is a duty that ought to be accomplished outside the cylinder. The gas engine is a model for other internal combustion prime movers. The nearer the gasoline and the petroleum engine attains to the prototype the more perfect necessarily becomes the action. Waste heat, unavoidable under any known, practical cycle, should be employed to furnish latent heat and to vaporize. The lowered compression curve is thermodynamic loss.

(To Be Continued.)

## DRASTIC LEGISLATION PROPOSED.

### National Automobile Association Learns of Steps to Be Taken.

The National Automobile Association, with headquarters at 6 Beacon street, Boston, Mass., is decidedly active in the promotion of all matters of interest to motorists in general, and its members in particular. In a recent notice to members it announced that special arrangements had been made with the Beacon Auto Supply Company, 698 Washington street, Brookline, Mass., to vulcanize members' tires and tubes, these to be sent to the office of the association or at the quarters of the Pathfinder Automobile Company, 1112 Boylston street, Boston, Mass. Another important notice, which will prove of general interest to motorists, reads as follows:

Owing to the rapidly increasing number of deaths and injuries to persons and property, due to accidents in which motor vehicles are involved, a new association has been formed to prosecute motorists. It is reported it will undertake not only to prosecute the motorists, but will endeavor to procure from the forthcoming session of the legislature drastic automobile legislation.

This organization is reported to be in favor of fines ranging from \$500 to \$1000 for the first offense of over-speeding, and imprisonment for six months for subsequent breaches of the law. Declarations such as these have aroused considerable interest among municipal authorities, and it is evident, from their statements, as well

as from the police of a number of cities and towns, that the automobile laws of the commonwealth may be radically amended, but in any event will be very strictly enforced during the coming year.

The National Automobile Association is as much opposed to drunken, reckless or unreasonable operators of automobiles as is this new association, or any right-minded citizen; and has frequently, since its organization, sought and secured the revocation of the licenses of improper and unfit automobile operators. With these operators the association has no sympathy whatever. On the other hand, the owners of automobiles in Massachusetts are increasing at an enormous rate, and it is estimated that during the past year their owners have contributed about \$2,000,000 to the state, its cities and towns. For these and other reasons, therefore, they are entitled to certain, if not very favorable consideration.

In order, therefore, that there should not be enacted such drastic legislation as has been intimated, or other radical legislation, it behooves members of the National Automobile Association to stand firmly for their rights and to assist in increasing the size and prestige of the association by urging their friends to co-operate and support the organization in its undertaking to secure a "square deal" not only from the legislation, but from state, city and town authorities as well. Will you have the kindness to recommend or suggest some person for membership in the association, in order that we may double its number during the coming year?

## RESULTS ARE IMPORTANT.

### George M. Dickson Gives National Dealers Something to Think About.

George M. Dickson, general manager of the National Motor Vehicle Company, Indianapolis, Ind., believes that the men who sell automobiles have fallen into a wrong habit in seeking to impress the public with the value of a given car. Recently, when asked to give his ideas concerning the proper method of judging a car, he answered with the one word "Results." He says:

It is a mistake to talk too much "parts" to the automobile buyer. The piano man does not spend all his time telling you he has certain kinds of strings, a certain pedal, a certain kind of wood, etc. He impresses you with the beautiful appearance of the piano. He charms you with the tone of the instrument. He delights you with its easy touch and creates a desire upon your part to possess that particular piano because of its quality, beauty, reliability and the reputation of its builders. In short, you buy that piano because of its results, not because of its individual parts.

Apply this to the automobile. Impress the owner that he should buy the car because of results—what it will do; how well it will perform, and not because of a bolt or a screw; not because of an accessory or specifications. Car owners today want service; reliable, continuous service, without worry or trouble. They want comfort and ease, accompanied by stately appearance. They want a whole car—and not parts.

Without considering the foreign connections covered by London and Toronto, the Goodyear Tire & Rubber Company, Akron, O., maker of Goodyear tires, has representatives in the following countries: Cuba, Porto Rico, Jamaica, Barbados, Trinidad, Republic of Panama, Ancon in the canal zone, Philippine Islands, Hawaii, Brazil and Uruguay. The company suggests that as a result of this foreign representation tourists should secure Goodyear tires without difficulty.



## IN THE COMMERCIAL VEHICLE FIELD.

### Features of the New Two-Ton, Worm Driven Truck Brought Out by the Pierce-Arrow Motor Car Company—Some Recent Installations of Merit.

**H**AVING demonstrated to its satisfaction that the principle of the worm drive as applied to its five-ton model is correct, from the viewpoint of both its engineers and its sales force, the Pierce-Arrow Motor Car Company, Buffalo, N. Y., has brought out a new two-ton worm driven truck chassis. The smaller machine is designed to meet the requirements of those who desire a lighter, dependable vehicle.

The motor does not differ essentially from

The clutch is a standard leather faced cone member, and between this and the three-speed transmission gearset is a double universal joint. The drive from the gearset is by shaft, with a universal joint at either end, and worm to a gear wheel with which is incorporated a spur gear differential. The rear axle is enclosed in a steel housing and is of the full floating type.

The chassis frame is a channel section, pressed from special steel and heat treated. It is 34 inches

wide, and is mounted on extra long semi-elliptic springs. The overall length of the chassis is 18 feet six inches, and the width 66 inches. The wheelbase is 150 inches. With a standard body the loading space is 10 feet six inches length by 72 inches width, and the total load, including the body, is given as 5200 pounds.

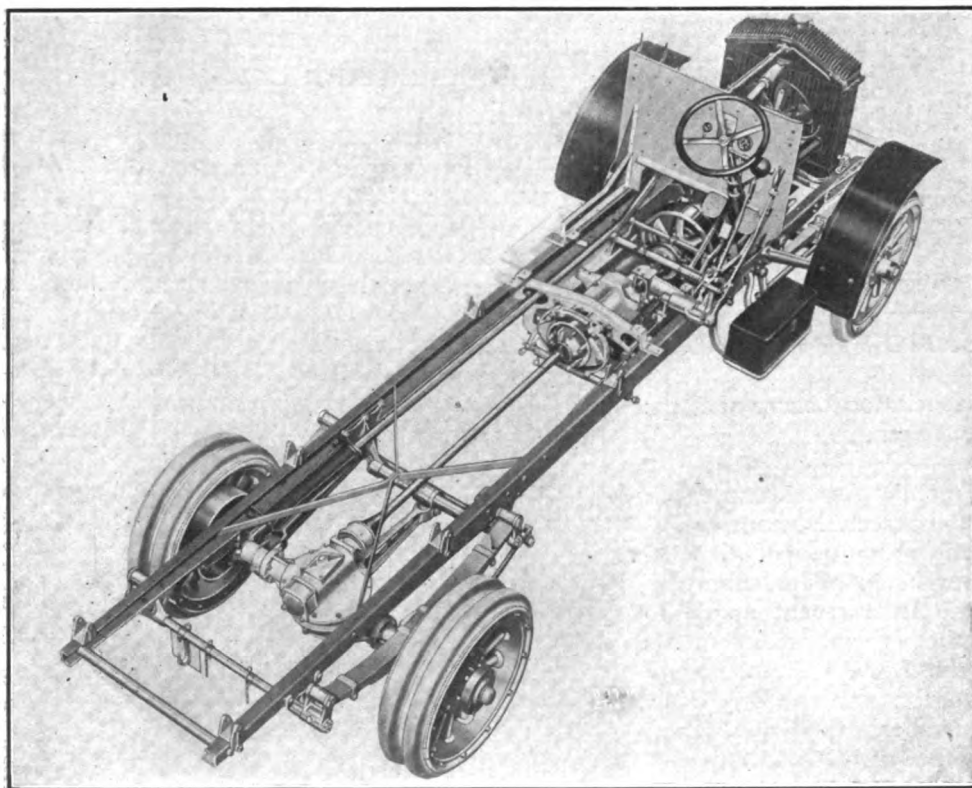
A feature of the construction is to be found in the fact that throughout the chassis, unusual care has been taken to minimize the attention to oiling and greasing, and so far as is possible, grease cups have been eliminated, a special type

of self-lubricating bearing being used. All bearing are liberal in size.

#### WHITE EMERGENCY WAGON.

**Street Railway Company Has a Maintenance Expense of 27.73 Cents a Mile.**

The Union Street Railway Company, New Bedford, Mass., has in service a three-ton White



**General View of the Chassis of the New Pierce-Arrow Worm Driven Two-Ton Truck.**

that utilized in the larger chassis, except in its size. It is a four-cylinder, four-cycle, water-cooled, T head unit, with bore of four inches and stroke of 5.5, giving a rating of 25.6 under the S. A. E. formula. It is stated to develop 30 horsepower at 1000 revolutions and is governed automatically at 1050. The cylinders are cast in pairs. Lubrication is by rotary pump. Ignition is by Bosch high-tension magneto. The carburetor is the firm's own make, and is of the automatic type.



truck, made by the White Company, Cleveland, O., with which it is extremely well satisfied. The general superintendent of the company, Elton S. Wilde, has caused very accurate record to be kept of the expense of the machine, with the result that it is found that during its first year it was operated a total of 7953 miles at a maintenance cost of 27.73 cents a mile.

The machine is utilized as an emergency wagon, and as such is called upon to undertake a large number of varied tasks. Mr. Wilde states it would be somewhat less difficult to enumerate the work it is not called upon to do. It was purchased primarily for hauling material in construction work, but it is available for duty at all hours of the day or night. Sometimes it is in charge of one man. At other times it is hurrying over the road at its best speed with 15 or 18 section hands and a load of poles or wires to mend a break in the line. It has served as a tow-er wagon. It has transported exhibits, etc., in promoting an outing park in the suburbs of the city. It is at the beck and call of the entire system, so to speak.

The record of expenses that has been kept is extremely accurate. For instance, on one occasion the truck was called upon to tow another machine to a local garage. Mr. Wilde is able to tell exactly what that piece of work cost his company. The truck was placed in service March 1, 1912, and the figures submitted herewith were compiled to Feb. 28, 1913. The only item that seems to need additional explanation is

Annual maintenance account of White three-ton truck in service with Union Street Railway Company, New Bedford, Mass.\*

|                            | Mile            | Total            |
|----------------------------|-----------------|------------------|
| Gasoline .....             | \$0.0224        | \$178.15         |
| Grease .....               | 0.0048          | 38.17            |
| Oil .....                  | 0.138           | 109.75           |
| Supplies .....             | 0.0029          | 23.06            |
| Labor, painting, etc. .... | 0.0282          | 224.27           |
| Top .....                  | 0.0042          | 33.40            |
| Tires .....                | 0.0487          | 387.31           |
| Overhead .....             | 0.1523          | 1210.98          |
| <b>Totals .....</b>        | <b>\$0.2773</b> | <b>\$2205.09</b> |

\*Cost a mile taken from company's books; totals carried out on basis of 7598 miles actually travelled.

that of "Top." The machine was purchased without a top over the driver's seat, and it was decided later to add this comfort.

### SAVING TWO DOLLARS A DAY.

Two Knox-Martin Tractors Will Soon Pay for Themselves in Mt. Vernon, N. Y.

One of the first Knox-Martin tractors made by the Knox Automobile Company, Springfield, Mass., was installed with the fire department in that city on a contract under the terms of which the city was to have a full year in which to test its economy and efficiency. The machine was attached to a water tower, which had proven too heavy for horse, and which, for this reason, was not kept in active service. Before the year was

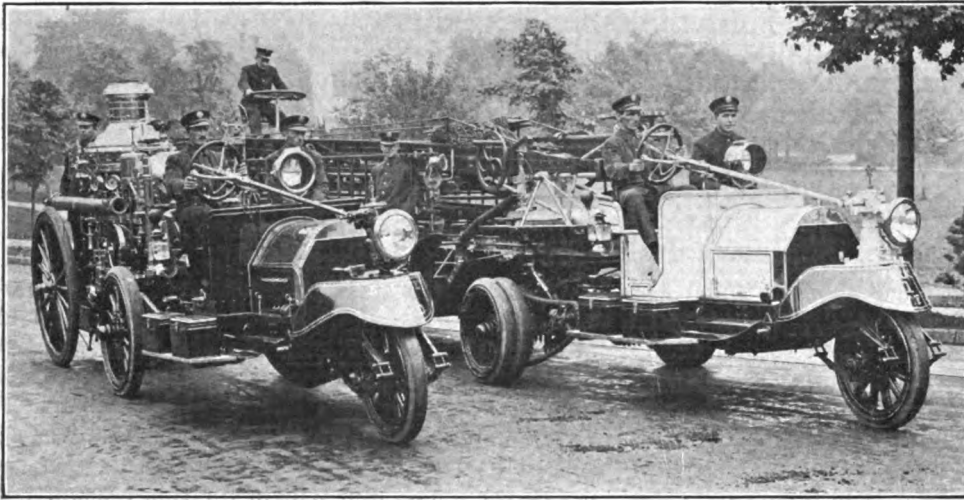


White Three-Ton Truck Transporting Rails for New Bedford Street Railway.

up the city had purchased the vehicle, it having been demonstrated in one fire alone that it was advisable to have the water tower in constant service, and that the tractor was the proper means of propelling it. The city has now purchased a second vehicle of the same maker, for use with one of its hook and ladder trucks.

Herewith are presented two pieces of apparatus owned by the fire department in Mt. Vernon, N. Y., one a steam fire engine and the other a large hook and ladder truck. The latter has a double equipment of ladders and therefore presented a problem somewhat similar to that of Springfield's water tower, in that it was found exceedingly heavy for horses. The purchase of the two Knox-Martin tractors made necessary but very little rebuilding in order to make this





**Two Knox-Martin Tractors Attached to Fire Apparatus in Mt. Vernon, N. Y.**

portion of the department motor driven.

When the horses were employed the maintenance cost of the two pieces figured at \$72 a month. Motor driven, the expense has been less than \$2 a month each. This leaves a balance of \$68 a month, or a little better than \$2 a day, in favor of the Knox-Martin tractors. And, of course, the limited cost of converting the two pieces was an item of no small consequence in considering the proposition in the first place.

#### **COLD STORAGE BAKER TRUCK.**

##### **Electric Machine with Special Body for Porto Rican Ice Company.**

The Porto Rico Ice Company at Hielo, P. R., has recently purchased and placed in service a three-ton Baker electric truck, made by the Baker Motor Vehicle Company, Cleveland, O., the body for which was specially constructed to meet the demands of the business. The company has a plant where ice is produced by mechanical methods, and this must be transported to a substation some six miles distant. The design of the body was with a view to handling the prod-

uct with a minimum loss.

The front, sides and walls are double, four inches thick, with the spaces packed with ground cork. The floor is 4.5 inches thick and it is built of one-inch oak, under which is a 1.75-inch layer of asphalt composition, and below this is a layer of one-inch cork board laid on Georgia pine board .75 inches thick. The rear is

closed by double doors and a high tail gate, these being of standard refrigerator construction, with double walls and packed with cork. Any one or all of these may be opened to load or unload the truck. Near the rear of the body may be seen the drainage outlets, which are trapped so that warm air will not be admitted, and when the doors are closed the interior is as tightly sealed as is a refrigerator or an ice box.

Within the body is a series of adjustable crossbars, by which the ice may be held in place, so that it will not shift in transit. Back of the driver's seat is a ticket box in which may be deposited the tickets received for the sale of ice, since the driver is not permitted to handle the money, and the customers pay with coupons that are purchased from the company. It will be seen that the vehicle is available for delivery as well as



**Baker Electric Truck with Specially Built Body for Transporting Ice.**



transportation from the manufacturing plant to the sub-station.

### BROWN FUNERAL CAR.

#### Indiana Manufacturer Finds Demand for This Product Is Increasing.

Something like a year ago, at the annual convention of funeral directors in the Middle West, action was taken looking toward a more general adoption of the motor vehicle. At that time the delegates to the convention were not prepared to state definitely that motor driven hearses would entirely supersede those drawn by horses, but it was the consensus of opinion that it was wise to give the subject deliberate consideration. Of course, motor driven casket wagons have been in service in all sections of the country for some time.

An accompanying illustration presents a funeral car—a name which appears to have entirely superseded the older term with the appearance of the newer type of vehicle—made by the Brown Commercial Car Company, Peru, Ind., for A. Geissel & Sons, a funeral director in Philadelphia. The chassis is standard, but it will be noted that it is mounted on pneumatic tires, and other provisions made for easy riding qualities. The appointments are quite as ornate as with the horse drawn vehicle, and in every respect there appears to have been a careful consideration by the designer of the use to which it will be put.

This car took part in the recent motor truck parade in Philadelphia and attracted much favorable comment. Will H. Brown, president of the company, who recently returned to the factory from a visit to New York City, announces that he has orders on hand for several of these vehicles for delivery in the East.

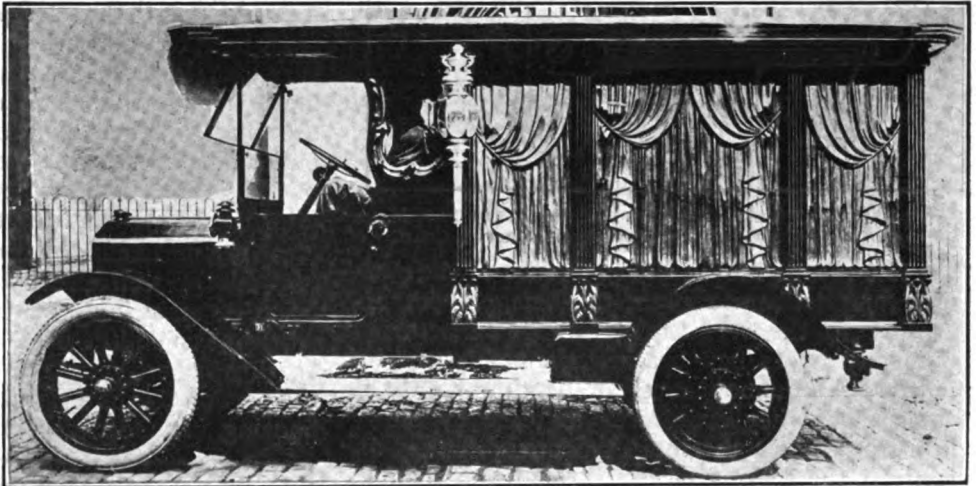
The ninth annual Omaha automobile show will be held Feb. 22-27, under the management of Clark G. Powell, as in the past.

### BOSCH AT FIRE EXHIBIT.

#### This Type of Ignition Well Represented at Recent Convention in New York City.

Manufacturers of ignition apparatus are very much interested in noting the number of vehicles utilizing their equipment in the more important exhibitions and events throughout the year. The Bosch Magneto Company, New York City, made a thorough canvas of the fire apparatus on display in the Grand Central Palace in connection with the recent convention of the International Association of Fire Engineers.

It reports that 29 of the 30 pieces of apparatus shown were Bosch equipped, giving a percentage of 96.6. At the 12-hour test held on the



Brown Funeral Car Recently Delivered to an Undertaking Concern in Philadelphia.

Hudson river pier, 11 pieces started, while but seven finished. Of the seven, the company finds that all used Bosch magnetos and five used Bosch plugs.

A battery of automobiles equipped with Goodyear tires, made by the Goodyear Tire & Rubber Company, Akron, O., recently started on a tour of the western army posts under command of Col. R. P. Davidson. Each car was equipped with machine guns and wireless outfits. They travelled on parallel roads and communicated by wireless. The different squads met at principal points along the route, varying from five to seven miles. Col. Davidson was assisted by two United States army officers who were detailed by the War Department to accompany the delegation of wireless operators.



## THE REPAIR SHOP AND THE GARAGE.

### Suggestions for Removing and Replacing Anti-Friction Bearings of the Ball Bearing Type—Tools Facilitating the Work.

**M**ANY anti-friction bearings are damaged in the removal or during application when repairing mechanism in which they are mounted,

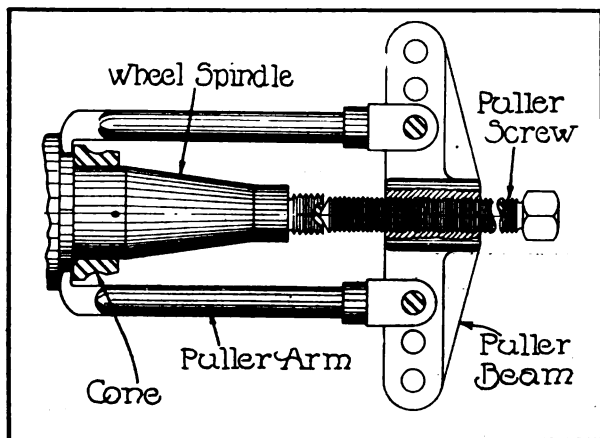


Fig. 1—Modified Form of Wheel Puller Having Two Arms and Cross Beam for Displacing a Bearing Cone.

but this results more from ignorance of their nature than deliberate intent to damage them, according to the New Departure Manufacturing Company in its ball bearing manual issued recently. A common cause of bearing failure is noted when they are driven in place by blows from an ordinary machinist's hammer applied directly to the bearing face or through the medium of a steel drift or blunt cold chisel. Ball bearings should never be driven in place or removed by the use of steel or other hard metal tools because the race members may be permanently sprung or deformed by this treatment.

Wherever the construction permits, bearings should be removed by direct application of pressure to the part that is tightly fitted. When a bearing is mounted in a wheel hub, as indicated at Fig. 2, a simple form of wheel puller can be employed to advantage. This is a substantial casting of malleable iron or bronze made approximately the same shape as the hub cap, threaded inside to fit the hub and having a substantial set screw at least .75 inch in diameter passing through the threaded boss at the centre. The screw should be long enough to pull the wheel and bearing entirely off the spindle or axle tube. A shouldered plug of steel with a depression drilled therein to locate the screw point may be pushed in the hollow tube to centralize the screw

pressure. In use, the wheel puller casting or wheel is kept from turning and, as the screw advances, it pulls off the wheel and the bearing it contains.

A modified form of puller having two arms and a cross beam that can be used when a bearing cone must be removed from an axle or spindle is shown at Fig. 1. An attachment to permit it to remove a bearing of the unit type, such as a single or double-row annular, without exerting any pressure on the balls or outer race is clearly depicted at Fig. 3. This consists of a split casting adapted to be clamped loosely around the shaft back of the bearing inner race and any pressure exerted to remove the bearing is applied directly against the member which is a force fit on the shaft. When any form of hub or bearing puller fails to start the member to which it is applied by direct pull, its action may be accelerated after the screw has been tightened sufficiently to place the parts under a certain initial tension by a few sharp, well directed hammer blows on the beam or main body of the device. In all cases, where possible, the pressure applied to remove a bearing or part should be exerted directly against the portion that is a tight fit on the shaft or in the housing. In most cases it is the inner member of

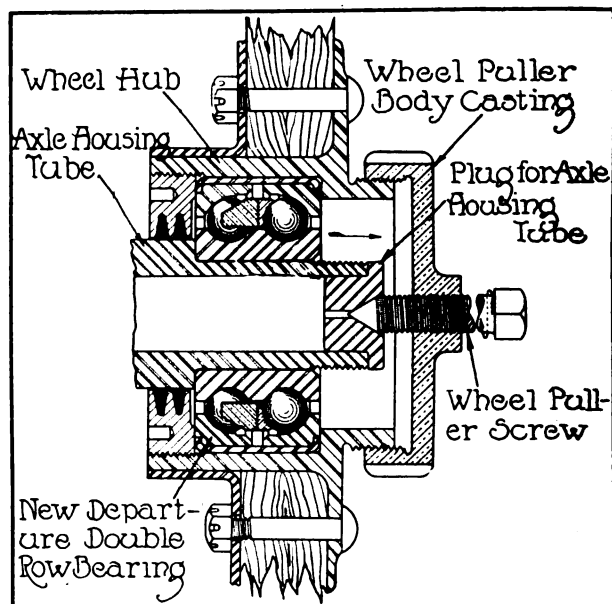


Fig. 2—Hub Wheel Puller for Removing Wheel and Bearing from Shaft or Axle Tube.



the bearing that is a force or press fit on the shaft; the outer member is usually a push fit in the housing and may be removed easily.

If it is necessary to force the bearing off with a series of blows, always use a brass or hard babbitt metal bar or drift, or even a piece of hard maple, hemlock or oak. Do not direct all the blows at any one point on the bearing as this tends to cramp it and will make it harder to drive off. Distribute them evenly around the entire circumference, always having successive blows at points diametrically opposite.

When driving bearings in place, it is always best to use some form of soft metal yoke member as shown at Fig. 4. or a tubular section piece as indicated at Fig. 5. With either the yoke or the other tubular form, the hammer blows are distributed evenly and the bearing is driven into place without injury to either the shaft or bearing components. When a double fork member

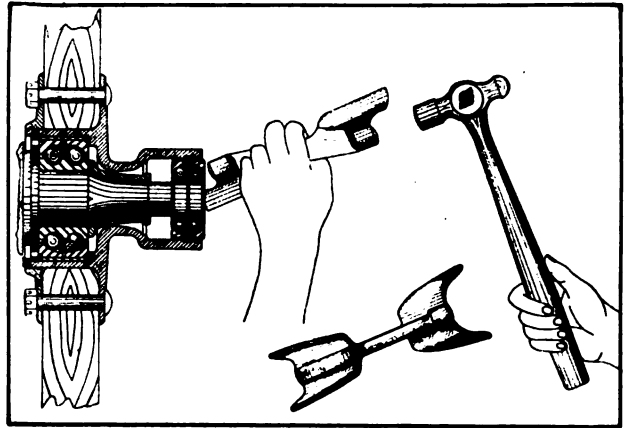


Fig. 4—Illustrating Proper Method of Driving Bearings in Place with Yoke Member of Soft Metal.

lead is well supported, every blow of the hammer acts with telling effect and there is no rebound after the impact.

### SUGGESTS IODINE FOR CUTS.

Cut and bruised fingers are not uncommon, and owing to the dirt and oil working into these, they are difficult to heal. A repairman recommends the use of iodine instead of diluted carbolic acid, etc., stating that the former penetrates all lubricant and dirt, has a beneficial effect and causes the wound to heal more rapidly.

### GRAPHITE AFTER VALVE GRINDING.

It is said that the use of dry graphite for finishing the work of valve grinding is decidedly beneficial as a fine surface is obtained on the seat and valve proper. The graphite is utilized after the grinding is completed and the seat and valve should be wiped dry before using the material.

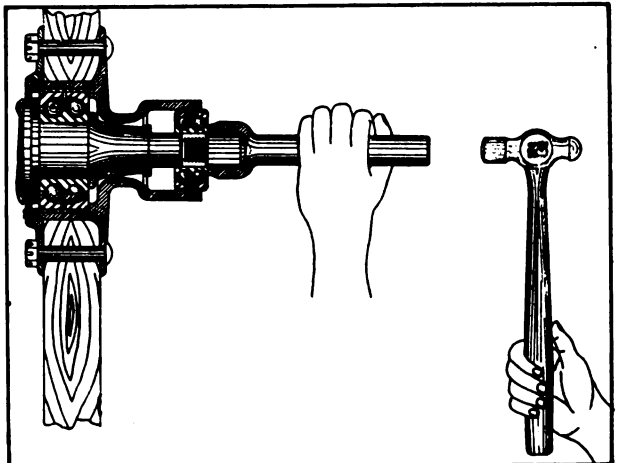


Fig. 5—Showing How the Blows of Hammer May Be Distributed Evenly with Tubular Tool.

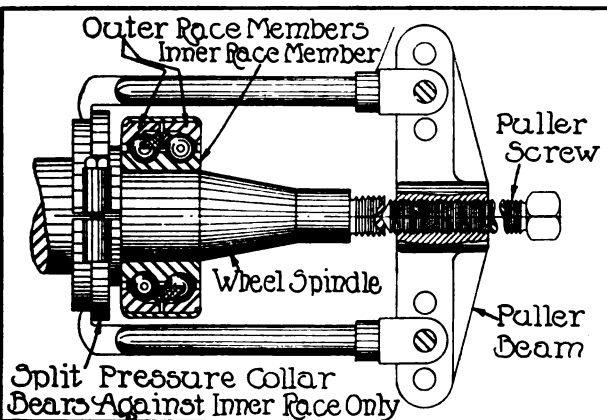


Fig. 3—Construction for Removing Single or Double-Row Annular Bearings Without Exerting Stresses on the Balls.

is used, one end can be made to drive against the inner race member, while the other can be spread enough to fit the outer race if desired. Complete instructions on ball bearings are given in the manual which will be forwarded free by addressing department D of the New Departure Manufacturing Company, Bristol, Conn.

### SOFT METAL PUNCH.

In driving out shafts, etc., the ends are apt to become damaged even with the use of a copper or brass drift. The following suggestion for a drift is made by a repairman: Take a piece of weldless steel tube, 1.5 inches in diameter and nine long, and braze a wrought iron plug in one end. Next fill the tube with molten lead. It is said that it makes a most efficient punch as the



## MARTINI-HUNEKE SAFETY STORAGE SYSTEM.

A STORAGE system for handling volatile, inflammable liquids which differs from conventional practise and presents many interesting features, is the Martini & Huneke safety system marketed by the Martini & Huneke Company, Woolworth building, New York City, which concern is affiliated with a large number of companies abroad where the system has been employed for the past eight years. As the application of the system is so varied only a general outline is given herein, but installations are made to meet varying requirements whether for a manufacturing plant or a garage. The company maintains a corps of experienced engineers and is prepared to submit plans and specifications.

The most prominent features of the system are the means employed to prevent loss by evaporation, protection against fire or explosion and

to the formation of an explosive mixture.

The principle of the Martini & Huneke system is shown at Fig. 2, it comprising a storage tank of heavy sheet steel buried in the ground, inlet and outlet valves, a cylinder of compressed inert gas for protecting the liquid and for forcing it through the pipes, and jacketed pipes connecting the different parts of the system. The components shown are as follows:

1, storage tank; 2, 3, 4 and 5, anti-diffuser; 6 and 7, jacketed pipe connection to draw-off valve; 8, jacketed intake pipe; 9, carbon dioxide cylinder; 10, high pressure gas line to regulator; 11, pressure regulator; 12, low pressure gas line to storage tank; 13 and 14, jacketed draw-off valve; 15, mercury manometer; 16, liquid intake valve; 17, gas valve for equalizing pressure; 18, syphon for emptying drum; 19, shipping drum.

To charge the storage tank it is first filled with inert gas, then connected to the drum by means of a jacketed pipe and syphon. The pipes are provided with two valves, through one of which the liquid is syphoned into the storage tank, while the other permits gas from the storage tank to replace the liquid in the drum as fast as it runs out. This prevents any liquid left in the drum from coming into contact with the air and forming an explosive mixture.

The pressure of the gas in the main tank determines the height to which the liquid rises in the piping system, while the annular jacket space surrounding the distributing pipes is always in communication with the inert gas in the storage tank and assures an instantaneous return of all the liquid contained in the piping in case of any leak. In either case the liquid returns to the storage tank by gravity. As a further protection each pipe entering the tank passes through an anti-diffuser, which device serves as a safety valve, preventing the inert gas from leaving the tank and being replaced by air in the event the piping system is destroyed by fire. All of the outer pipes are fitted with fusible plugs which melt at a low temperature, insuring a return of the liquid to the tank.

To draw the liquid it is only necessary to press the lever of the discharge valve shown at the right in Fig. 1, the fuel immediately rising through the jacketed pipe, owing to the pressure of the gas, and it continues to flow until the lever is released. The jacketed pipes referred to include an inner tube having three or more longitudinal ribs to keep the walls of the two pipes apart. The anti-diffuser operates on the principle of the Davy safety lamp, its upper part being filled with wire gauze admits either liquid or the

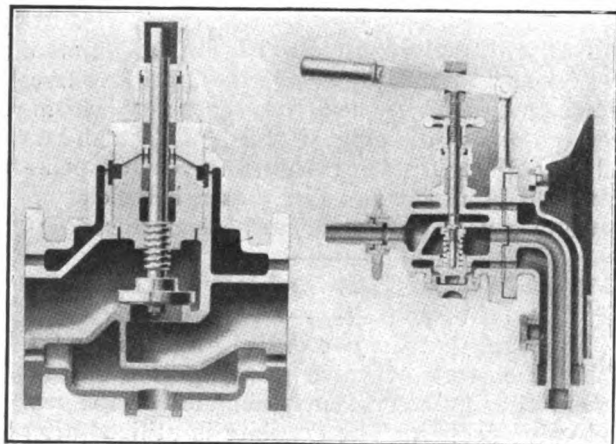


Fig. 1—Line and Draw-Off Valve Utilized with Martini & Huneke Fuel Storage System.

manner of handling the fuel, even when the main container is being filled. Another interesting feature is that leaks are instantly noted, it being possible to verify at once the normal operation of the system.

Throughout the apparatus in which the liquid is stored or handled, air is replaced by carbon dioxide (commonly known as carbonic acid gas) or other inert gas which not only determines the movement of the liquid, but also serves as a protecting agent. This gas fills the jackets of all the pipes and valves, acting in such manner that the liquid can circulate only when the system is absolutely free of leaks. For example: If a leak occurs, the pressure of the gas will disappear and the liquid will remain in the tank where there is no danger of explosion, since air is necessary



gas, but prevents the passage of a flame into the tank. The bottom of the device is cupped to prevent diffusion of the gas in the tank after pressure has been reduced to that of the atmosphere, it being filled with liquid.

For small installations carbon dioxide gas, readily obtained, is utilized, but with large systems a special apparatus is supplied for produc-

ing an inert gas. A charging panel is also supplied containing one or more inlet valves and connections, and a receptacle for the gas cylinder is included. Special measuring apparatus can be furnished to suit requirements as with conventional fuel storage systems. The Martini & Huneke system is also constructed for tank wagons and other carriers of inflammable liquids.

### GOOD FUEL RECORD.

#### California Man Crosses Continent with Average Consumption of 15.38 Miles.

Dr. Lee C. Denning, Pasadena, Cal., believes he has created a new transcontinental record for fuel consumption, as a result of his recent arrival in New York City. He left Pasadena, May 31, taking the Midland Trail to Salt Lake City, and then the Overland Trail through Cheyenne and Omaha, thence to his former home in Oil City, Penn., after which he toured the Adirondacks region, a portion of Canada and the New England states before reaching New York City. The total distance covered was 10,238 miles, and the fuel consumption figures out at 15.38 miles to the gallon.

The car was a model 69 Overland, made by the Willys-Overland Company, Toledo, O. The road conditions presented practically every variation that could be found in the United States. The load, including passengers, camping equipment, etc., totalled about 1500 pounds. There was no serious breakage throughout the long journey, the only real accident being the fracture of one leaf of a rear spring when the car plunged into a washout in the western desert. The two front tires which left Pasadena were still on the machine when it arrived on Broadway.

### INDORSES ADAMSON BILL.

#### American Automobile Association Takes Action on Important Matters.

At the meeting of the directors of the American Automobile Association in Buffalo, N. Y., last week, Congressman Adamson's federal reg-

istration bill, the full text of which is presented elsewhere in this issue, was indorsed. Dr. H. M. Rowe, president of the Automobile Club of Maryland, and chairman of a special committee on traffic regulations, presented the first draft of uniform regulations upon which his committee has been working. Another special committee was created to look into the matter of grade crossings, of which Preston Belvin, president of the Virginia State Automobile Association, is chairman. Upon invitation, Dr. E. Stagg Whitin, executive chairman of the national committee on

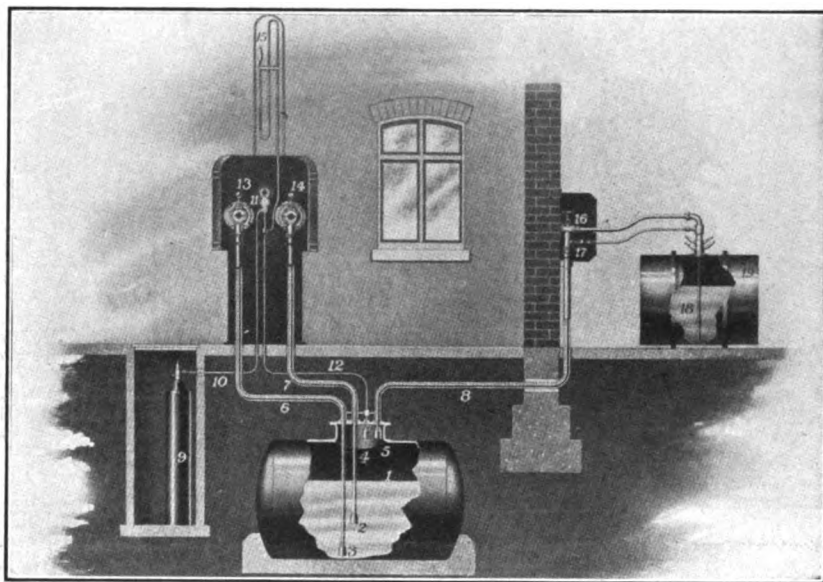


Fig. 2—Components of Martini & Huneke Storage System Employing Pressure of Inert Gas and Having Many Interesting Features.

prison labor, was heard, and the directors decided to co-operate with this association in furthering the employment of prison labor in good roads construction.

At the conclusion of the meeting the board inspected a number of excellently constructed roads in the vicinity of Buffalo, these including surfaces of vitrified brick, concrete, asphalt and oiled macadam. The annual meeting will be held in Richmond, Va., Dec. 1-3. The election of officers will take place at that time and several important plans will be discussed.



## IN THE REALM OF THE MOTORCYCLIST.

### List of Exhibitors at Coliseum Show in Chicago in November--Bosch Trophy Still Remains Unawarded---Racing Results and Club News.

**T**HE committee in charge of the arrangements for the second exclusive motorcycle show in the Coliseum at Chicago, Nov. 3-8, appears to have the preparations well in hand. All the available exhibition space in the big building will be utilized to advantage, according to present indications. The decorative scheme will be simple, the various exhibition spaces being divided by ornamental pillars supporting wooden railings. The color scheme will be sage green and white. The following list of exhibitors has been made public by General Manager A. B. Coffman:

Harley-Davidson Motor Co., Milwaukee, Wis.  
 Excelsior General Supplies Co., Chicago.  
 Universal Machinery Co., Milwaukee, Wis.  
 Van Cleef Bros., Chicago.  
 Continental Rubber Works, Erie, Penn.



**Weston Kent Thomas, New Eastern District Manager, Miami Cycle & Manufacturing Company, on His Farm Near Middletown, O.**

Hawthorne Mfg. Co., Bridgeport, Conn.  
 Minneapolis Motorcycle Co., Minneapolis, Minn.  
 Excelsior Motor & Mfg. Co., Chicago.  
 Jenkins & Co., Des Moines, Ia.  
 Miami Cycle & Mfg. Co., Middletown, O.  
 E. & C. Mfg. Co., Philadelphia.  
 Purdy Bros., Chicago.  
 R. J. Leacock Sporting Goods Co., San Francisco.  
 Nathan Novelty Mfg. Co., New York City.  
 Angsten-Koch Co., Chicago.  
 Iver-Johnson Arms & Cycle Works, Fitchburg, Mass.  
 F. W. Spacke Machine Co., Indianapolis, Ind.  
 American Motor Co., Brockton, Mass.  
 Jones & Noyes, Chicago.  
 Majestic Mfg. Co., Worcester, Mass.  
 Reading-Standard Co., Reading, Penn.  
 Motor Car Equipment Co., New York City.  
 Emblem Mfg. Co., Angola, N. Y.  
 Eclipse Machine Co., Elmira, N. Y.  
 New Lite Mfg. Co., Newton, Ia.  
 Milwaukee Motorcycle Mfg. Co., Milwaukee, Wis.  
 Stewart-Warner Speedometer Corp., Chicago.

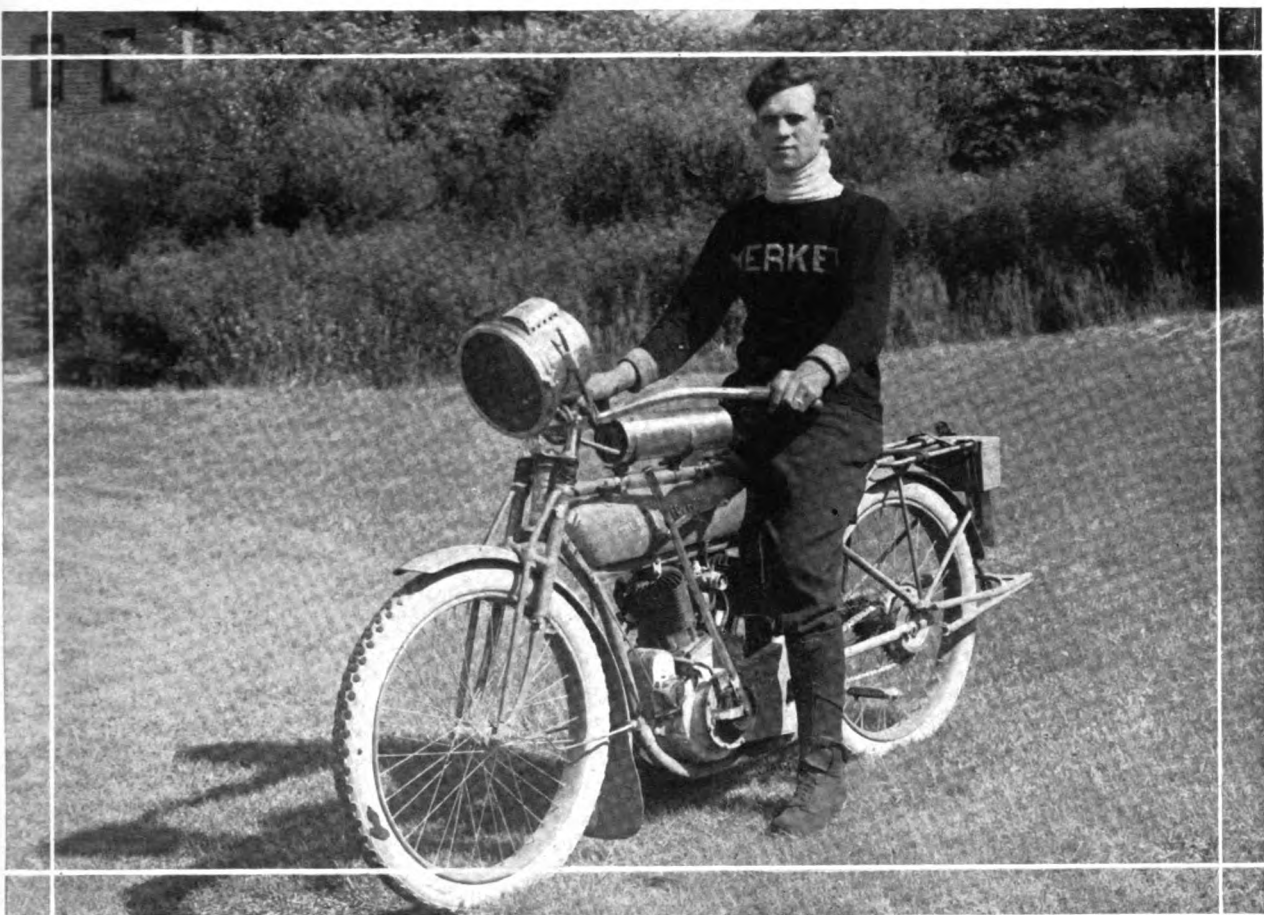
Greyhound Motor Co., Buffalo, N. Y.  
 Great Western Mfg. Co., La Porte, Ind.  
 Standard Welding Co., Cleveland, O.  
 Grafton Glove Co., Grafton, Wis.  
 Splittdorf Electrical Co., Newark, N. J.  
 International Stamping Co., Chicago.  
 Hendee Mfg. Co., Springfield, Mass.  
 Stevens & Co., New York City.  
 Benford Mfg. Co., Mount Vernon, N. Y.  
 Allied Motors Corp., Chicago.  
 Wizard Motor Co., Indianapolis, Ind.  
 Bosch Magneto Co., New York City.  
 New Departure Mfg. Co., Bristol, Conn.  
 Aurora Automatic Machinery Co., Chicago.  
 Pope Mfg. Co., Hartford, Conn.  
 Badger Brass Mfg. Co., Kenosha, Wis.  
 Chicago Cycle Supply Co., Chicago, Ill.  
 Davis Sewing Machine Co., Dayton, O.  
 Herz Magneto Co., New York City.  
 A. R. Mosler & Co., New York City.  
 Wheeler & Schebler, Indianapolis, Ind.  
 Consolidated Mfg. Co., Toledo, O.  
 Chicago Belting Co., Chicago.  
 N. H. Van Sicklen, Chicago.  
 Beckley Ralston Co., Chicago.  
 Feilbach Motor Co., Milwaukee, Wis.  
 Crear Adams Co., Chicago.  
 Pierce Cycle Co., Buffalo, N. Y.  
 Excelsior Cycle Co., Chicago.  
 Wald Mfg. Co., Sheboygan, Wis.  
 Stoll Mfg. Co., Denver, Col.  
 Randall-Falchney Co., Boston, Mass.  
 Weed Chain Tire Grip Co., New York City.  
 Henderson Motorcycle Co., Detroit.  
 Diamond Chain & Mfg. Co., Indianapolis, Ind.  
 Atlas Specialty Co., Chicago.  
 National Cycle Accessory Co., Aurora, Ill.  
 Barco Brass & Joint Co., Chicago.  
 B. & L. Auto Lamp Co., Chicago.  
 American Wood Rim Co., Onaway, Mich.  
 Marburg Bros., Inc., New York City.  
 Kokomo Rubber Co., Kokomo, Ind.  
 Fentress-Newton Mfg. Co., Detroit.  
 Dean Electric Co., Elyria, O.  
 Hine-Watt Mfg. Co., Chicago.  
 Svensgaard Sales Corp., Detroit.  
 H. & F. Mesinger Mfg. Co., New York City.

#### Latest Merkel News.

Not being content with its new branch plant at Indianapolis, Ind., and the additions recently constructed in connection with the main factory at Middletown, O., the Miami Cycle & Manufacturing Company, maker of Flying Merkel machines, has started work on a new frame department at Middletown. This structure, the foundation for which was completed last week, will be of brick and will cost about \$25,000. It is expected that it will enable the company to double its daily output of both motorcycle and bicycle frames.

In order to be in a better position to supply the market in the district comprising the six New England states, it has been decided to open a direct factory branch in this territory. The branch will be located at 315 Dwight street, Springfield, Mass., and will have its official opening Oct. 1.





## PERFECT SCORE=1,000 POINTS

Indicates a great deal to the motorcycle rider, for it means that the motorcycle which can go through a gruelling endurance contest without the slightest mechanical trouble is the machine to depend on for day in and day out service.

In the 600 miles Ohio State F. A. M. grind

**THE FLYING MERKEL**

scored another triumph. Herman Sill, of Cleveland, on the 7 H. P. Merkel shown above, finished the contest with a perfect score—made every control on time and easily passed every competing machine in the contest when he met them on hills or in mud or sandy going—with the Flying Merkel you always have a perfect machine and a perfect score.

### STILL ANOTHER VICTORY

In the Detroit M. C. Annual Endurance run over 400 miles of the worst roads of the country 30 riders started—only two finished perfect. B. A. Waltz, riding the only Flying Merkel entered—finished perfect.

Waltz rode a 7 H. P. belt drive Merkel—Sill, a chain drive. Flying Merkels are furnished with either belt or chain transmission. Always Remember—

*"If it passes you, it's a Flying Merkel."*

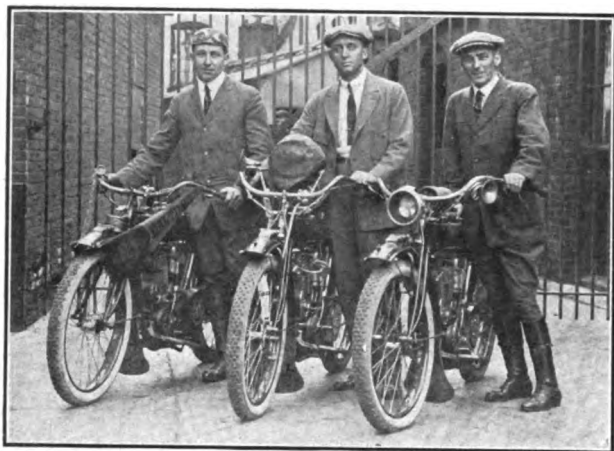
*Did you wire for agency?*

**The Miami Cycle & Mfg. Co.**  
320 HANOVER STREET.  
MIDDLETOWN, OHIO  
MEMBER M.M.A.

When Writing to Advertisers, Please Mention The Automobile Journal.



A full line of Flying Merkel motorcycles and bicycles, Raycycles, Hudsons and jobbing bicycles will be carried. The company also has leased the



**Indian Team in Cleveland-Newark Run: A. Zimmerman, F. L. Hunt and W. J. Yeubner.**

basement of the building, affording sufficient space to carry in stock several carloads of motorcycles and bicycles at all times.

C. A. Van Doren has been appointed New England branch manager and will make his headquarters in Springfield. George Schueller, at present assistant advertising manager at the Middletown plant, will assist Mr. Van Dorn. Mr. Schueller's successor has not been named. William McKinley Sheets, who has been covering the eastern territory as assistant to the late W. K. Aurandt, has been promoted to have full charge of the Long Island and New Jersey district. His place as eastern district manager has been filled by Weston Kent Thomas, who, although his duties require the greater part of his time, still finds pleasure in devoting attention to a small farm near Middletown, O. William G. E. Tytus, formerly of the sales department of the Colin Gardner Paper Company, has resigned to become affiliated with the Flying Merkel's selling force.

#### **The Bosch Trophy.**

A particularly unfortunate result of the recent "celebration" of the 10th birthday of the Federation of American Motorcyclists in Brooklyn, N. Y., was the failure to run off the 50-mile national amateur championship race, the completion of which is necessary before the Bosch trophy, awarded annually on a point system by the Bosch Magneto Company, New York City, can be presented.

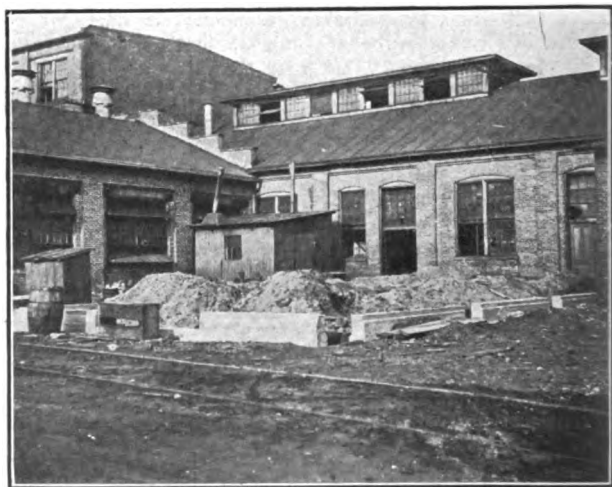
The other events in this series were held during the annual convention in Denver, at which time it was announced that the 50-mile race would be held in Brooklyn during this celebra-

tion. Later the directorate of the F. A. M. decided that a meeting could not legally be held in Brooklyn. It is difficult to understand why this should have affected the holding of the final race in the series, however, and it seems desirable that some steps should be taken to complete the series, both in justice to the competitors and to the Bosch Magneto Company, which has been a generous supporter of the motorcycle industry and the F. A. M.

As a result of the present situation, the contestants for the trophy have gained points as follows: Constant, 37; Feuerstein, 23; Attaberry, 11; Odiorn, four. The available points in connection with the 50-mile race are: First, 15; second, 10; third, eight. It will thus be seen that it would be possible for Feuerstein, for instance, to secure the award, if for any reason Constant were unable to finish the race.

#### **Arrested as Spies.**

Stanley F. Withe of Longmeadow, Mass., and Walter McKim of Brookline, Mass., recently returned from a 12,000-mile trip abroad, on which they encountered a number of adventures which were not included in the original schedule. Both boys rode Thor machines. They left Boston, June 7, shipping to Liverpool, where they set out to cross England, visiting the lake region, Stratford-on-Avon, Oxford and London, as well as many other points of interest. They then crossed the channel to Dieppe, going to Paris, Dresden, Berlin, Hamburg, Copenhagen and St. Petersburg. They returned to England by boat from



**Beginning Work on the New Frame Department of the Flying Merkel Plant, Middletown, O.**

St. Petersburg, and again crossed Great Britain to Liverpool to catch the Boston boat.

The most thrilling adventure of the trip came



just as the two young men crossed the boundary from France into Germany, in the little town of Gravelot. They were standing in the roadway with their machines lying by the roadside, when several German police officers took them into custody and hustled them before an impromptu court martial. Accused of being French spies they were locked up for the night, American friends vouching for their identity in the morning.

They were in the House of Commons when the Irish Home Rule bill came up for a vote. At another time they procured dapper little canes and presented themselves at the gates of Blenheim castle, while the Duke of Marlborough was giving a house party, and to their surprise were freely admitted. In Kidderminster, the motorcyclists caught a glimpse of King George and Queen Mary, who were then making their annual trip through that section of England.

### Recent Racing Results.

The following summaries indicate the results in various recent race meets throughout the country:

#### Quincy, Ill.

Three miles, free-for-all—First, Menhe, Indian; second, Maloney, Merkel; third, Doty, Merkel; time, 4:23.

Three miles, amateurs—First, Menhe, Indian; second, Doty, Merkel; time, 4:30.

#### Morrison, Ill.

Five miles, stock twins—First, Smith, Merkel; second, Machemer, Indian; third, Crocker, Thor; time, 6:57.

Five miles, singles—First, Hardy, Curtiss; second, Crocker, Thor; third, Brown, Harley-Davidson; time, 8:14.

Five miles, open—First, Machemer, Indian; second, Champlin, Henderson; third, Brown, Curtiss; time, 6:59.

#### Seattle, Wash.

Eight miles, professionals—First, Cogburn, Indian; second, Simmons, Excelsior; third, Rose, Excelsior; time, 7:32.5.

Twenty miles, professionals—First, Cogburn, Indian; second, Rose, Indian; third, Simmons, Excelsior; time, 19:08.5.

#### Dayton, O.

Five miles, professionals—First, Gardner, Excelsior; second, Jones, Merkel; third, Creviston, Excelsior; time, 6:17.4.

Three miles, amateurs—First, Gebhart, Thor; second, Watson, Indian; time, 5:00.

Ten miles, professionals—First, Gardner, Excelsior; second, Creviston, Excelsior; third, Birkenbach, —; time, 12:39.

Two miles, professionals—First, Gardner, Excelsior; second, Birkenbach, —; third, Wilkins, Harley-Davidson; time, 2:40.

#### Youngwood, Penn.

Five miles, amateurs—First, Martin, Indian; second, Dietz, Thor; time, not given.

Five miles, professionals—First, Schmidt, Indian; second, Beacon, Harley-Davidson; third, McCall, Indian; time, 6:24.

Ten miles, professionals—First, Beacon, Harley-Davidson; second, Roth, Thor; third, Markman, Indian; time, 13:35.

Ten miles professionals—First, Beacon, Harley-Davidson; second, Schmidt, Indian; third, Markman, Indian; time, 13:26.

Fifteen miles, professionals—First, Markman, Indian; second, Schmidt, Indian; third, Beacon, Harley-Davidson; time, 20:51.

### Club Notes, Here and There.

Members of the Taunton Motorcycle Club, Taunton, Mass., held a century run Sept. 14, the party visiting Fall River, New Bedford, Middleboro, Bridgewater, Brockton, Easton, Norton, Attleboro, Pawtucket and Providence.

Twenty-three of the 44 starters in the recent endurance run of the Rose City Motorcycle Club, Portland, Ore., to Seattle, Wash., and return, finished the event. But seven of these secured perfect scores. Those who finished and their scores follow: H. E. Meads, C. A. Hunt, C. A. Simmons, Carl Rose, Dan Boone and C. S. Hamilton, Excelsiors, and E. Bennett, Harley-Davidson, 1000; Guy Vernon, Excelsior, 999; Bert Hederly and Archie Fife, Harley-Davidsons, 996; Harry Eaton, Excelsior, 992; A. Kildahl, Eagle, 991; Victor Carlson, Harley-Davidson, 987; D. D. Hull, Indian, 974; M. C. Webster, Indian, 964; Gus Peppell, Excelsior, 953; A. Haril, Excelsior, 947; J. Schauteem, Merkel, 937; John Maier, Thor, 900; J. Eppenstien, Harley-Davidson, 888; Page Williams, Excelsior, 880; W. R. Singletray, Excelsior, 659; J. Carlson, Thor, 510.

Seventeen out of 26 starters finished the recent reliability run of the Ohio State F. A. M., from Cleveland, O., to Newark, N. J., and return, six of these having perfect scores. The results follow: Herman Sill, Merkel, 1000; C. Tunte, Harley-Davidson, 1000; F. L. Hunt and W. J. Teubner, Indians, 1000; Raymond Ray, Yale, 1000; E. Hawkins, Thor, 1000; A. Zimmerman, Indian, 997; I. F. Jacobs, Yale, 995; J. A. Campbell, Yale, 990; Walter Lawrence, Harley-Davidson, 989; E. Rischel, Pope, 986; J. M. Cargill, Merkel, 967; O. J. Oberwagner, Pope, 963; W. J. Lister, Harley-Davidson, 942; P. W. Stevens, Yale, 923; J. F. Grumbo, Excelsior, 906; Herbert Meyers, Harley-Davidson, 901.

The Providence Motorcycle Club, Providence, R. I., has issued entry blanks for its annual Triangle run, Oct. 5. The riders will leave Providence at 7 in the morning and are due to leave Boston at 10 and Worcester at 1 in the afternoon, returning to Providence at 4. The total distance is 138 miles. Special prizes will be awarded for sidecars. Entries close Oct. 2, with B. A. Swenson, 522 Broad street, Providence.



C. A. Van Dorn, Manager, New England Merkel Branch.

### JOIN THE F. A. M.

which is the National Organization fostering the interests of motorcyclists along legislative and other lines. Cut this out, mail it, and you will get the reasons.

#### E. M. ESTABROOK

Chairman Membership Committee Federation  
American Motorcyclists,  
BANGOR, MAINE.

Please send me the F. A. M. Booklet and all information interesting to prospective members.

Name .....

Address .....



# NEWS OF THE MANUFACTURER AND DEALER.

The following concerns have been incorporated recently to manufacture or deal in motor cars, accessories, supplies, etc.:

**Bellamore Toomey Company**, New York City; \$30,000; D. G. and D. R. Bellamore, Bronx; T. H. Toomey.

**Nichols Tire & Rubber Company**, New York City; \$5000; James C. Nichols, Yonkers, N. Y., and others.

**United States Pneumatic Rim & Tire Company**, Wilmington, Del.; \$1,000,000; Charles B. Bishop, Clarence J. Jacobs and others.

**Federal Auto Supply Company**, Buffalo, N. Y.; \$6000; Franklin E. Bard, Julius M. Schwert and others.

**American Motor League**, Philadelphia, Penn.; \$100,000; to manufacture and deal in cars and accessories; E. M. Wilke, John Groetch and others.

**Deatherage Airless Tire Company**, Richmond, Ky.; \$14,000; J. S. Collins, S. H. Deatherage and others.

**Cincinnati Velle Motor Sales Company**, Cincinnati, O.; \$5000; John J. Fauth, Elmer Strategies, J. J. Grogan.

**Edwardsville Garage & Auto Supply Company**, Edwardsville, Ill.; \$10,000; Thomas J. Fahnestock, Olin H. Glese, Walter Kriege.

**Commercial Auto Body Company**, New York City; \$12,000; to manufacture wagons and motor trucks; William

\$25,000; to sell automobile engine testers, etc.; R. Corin and I. M. Cohen, New York City; S. Mirbach, Mt. Vernon, N. Y.

**Reeves Garage & Motor Company**, Camden, N. J.; \$100,000; general automobile business; W. Lippincott, Haddon Heights; C. M. Reeves, Camden; A. Moulton McNutt, Collinswood.

**Motor Shop**, Trenton, N. J.; \$25,000; Robert C. Manning and others; 640 East State street.

**S. & M. Motor Company**, Detroit; \$10,000; to manufacture S. & M. car.

**McDonald Motor Car Company**, Milwaukee, Wis.; \$10,000.

## WITH THE MANUFACTURERS.

**The Herff-Brooks Corporation**, Indianapolis, Ind., sole distributor for Marathon cars, has appointed the following salesmen: South, F. E. Wilson, headquarters, Dallas, Tex.; New England, F. C. Carter; Atlantic Coast, Paul Morford. E. L. Hansel is added to the local retail staff.

**Charles E. Giltner**, director of sales for the Velle Motor Vehicle Company, Moline, Ill., is authority for the statement that the sale of Velle pleasure cars and trucks for the past year showed an increase of 117 per cent. over that of the previous year.

**Richard E. Baus**, a former Studebaker manufacturing expert, who has more recently been in charge of the Maxwell plant at Dayton, O., has rejoined the staff of the Studebaker Corporation, Detroit, as assistant to Production Manager Max Wollerling.

**W. A. McDermid**, sales manager of the Service Recorder Company, Cleveland, O., announces the appointment of the Atlas Commercial Company of Ponce and San Juan, P. R., as Porto Rican representative for the sale of the Service recorder. The company is now represented by

factory branches in the following cities: Boston, New York, Philadelphia, Baltimore, Washington, Atlanta, Buffalo, Pittsburg, Cleveland, Cincinnati, Indianapolis, Detroit, Chicago, St. Louis and Kansas City, and on the Pacific Coast by the Geo. F. Eberhard Company, with offices in San Francisco, Seattle and Portland.

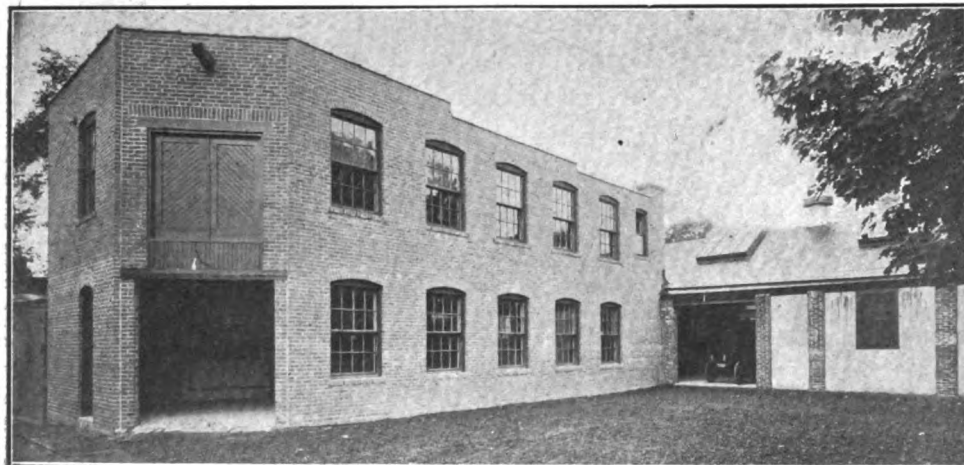
**Conrad Von Meyenburg**, director of motoculture in Basle, Switzerland, was a recent visitor of manufacturers in Detroit, in search of motor traction engines.

**The Southern Tire & Rubber Company**, Augusta, Ga., has elected the following officers: President, Weems A. Smith; vice president, H. S. Dunbar; secretary-treasurer, James P. Armstrong. It is announced that the company will locate a factory in that city in the very near future.

**L. M. Bradley**, well known in the industry through his connections with the old United States Motor Company, and more recently with the Willlys-Overland Company, Toledo, O., has been appointed assistant sales manager of the Moline Automobile Company, East Moline, Ill., which has secured a license to manufacture cars fitted with the Knight sleeve valve motor.

**John W. Eisenhouth**, Alameda, Cal., has purchased 1000 acres near Dumbarton point, San Mateo county, and it is understood that a portion of it will be utilized as a site for a factory for the production of automobile engines.

**William J. Benson**, San Jose, Cal., acting for a syndicate of business men, has purchased the Victory Motor Car Company's works at South First street, and it is announced that the plant will be devoted to the production of traction engines.



**Public Service Station of the Hartford Electric Light Company, Hartford, Conn.**

Hertz, Casper A. Schelper, Arthur W. Owen., 208 West 69th street.

**Carolina Motor Company**, Statesville, N. C.; \$25,000; H. H. Yount, S. B. Miller, J. M. Deaton.

**American Motor Transit**, Camden, N. J.; \$100,000; L. J. Bergdoll, F. R. Hansell, F. S. Garman.

**Baldwin Auto Garage**, Rutherford, N. J.; \$100,000; D. N. Knoller and M. Cohen, Newark; A. Ely, Jr., Rutherford.

**Times Square Automobile Company**, Chicago; \$150,000; to manufacture and deal in automobiles and accessories.

**Auto Cover & Supply Company**, Richmond, Va.; \$15,000; to manufacture and sell automobiles, etc.

**Mann Motor Car Company**, Pine Bluff, Ark.; \$10,000; to deal in automobiles.

**Harper's Motor Sales Company**, Charlotte, N. C.; \$25,000; W. J. Crowell, J. A. Rose, C. H. Gorman.

**Chester Rubber Tire & Tube Company**, East Liverpool, O.; \$250,000; president, John E. Newell; vice president, George A. Hasson; James C. Freshwater, George Arner.

**Potsche Storage Battery Company**, Chicago; \$75,000; to deal in batteries, electric and automobile supplies, etc.; J. N. Lucas, A. S. Coon and others.

**Los Angeles Cyclecar Company**, Los Angeles, Cal.; \$10,000; W. S. Bohannon and others.

**Grady Roueche Motor Company**, Salt Lake City, Utah; \$10,000; president, F. W. Roueche.

**Haynes Motor Sales Company**, Charlotte, N. C.; \$25,000.

**Oleson-Adams Manufacturing Company**, Detroit; \$10,000; to manufacture automobiles.

**Automobile Engine Tester Company**, New York City;





**Unexcelled American Genius  
Unexcelled American Skill  
Unexcelled American Manufacturing Processes**

have produced the Unexcelled, American-made, New Departure ball bearing—the bearing that has proved its superiority by actual service in 80 per cent. of American-made motor cars.

**Three Types:**

**Double Row**—A two-purpose bearing of maximum capacity for both radial and thrust loads.

**Single Row**—For radial loads only. An improved separator is an advantageous feature.

**Radax**—High grade cup-and-cone type bearing for sustaining radial loads and one-direction thrusts.

Descriptive catalog will be sent on request.

Engineering consultation service at your command. Send us your blueprints, speed and load data and we will tell you what size and type of bearing will best do your work with greatest efficiency and least friction and wear.

"Elimination of Friction" brochure, now in third edition, discusses the relative merits of balls and rollers in bearing work. A copy will be sent you free on request.

**The New Departure Mfg. Co.**

Department D      Bristol, Conn.  
WESTERN BRANCH: 1016-17 Ford Bldg., Detroit, Mich.

"New Departure Ball Bearing Manual" full of information for the garage man and dealer, just off the press. The only book of its kind. Ask us for it.

Special data sheets on New Departure Self-Aligning Shaft Hangings and use of New Departure Ball Bearings in machine tools sent free on request. Address New Departure Mfg. Co., Hartford Division, Hartford, Conn., for them.

When Writing to Advertisers, Please Mention The Automobile Journal.



**R. W. Hutchinson, Jr.**, for some time past with the International Motor Company, New York City, has become publicity engineer for the commercial vehicle department of the Packard Motor Car Company, Detroit.

**The General Motors Company**, Detroit, Mich., is expected to issue a statement in the near future showing that its earnings for the last year were more than enough to yield 20 per cent. on the common stock, as against 17.44 per cent. in 1912.

**The Electric Automobile Manufacturers' Association** held its annual meeting in Cleveland, O., Sept. 16, at which the following officers were elected: President, Louis E. Burr, Woods Motor Vehicle Company; vice president, R. C. Norton, Baker Motor Vehicle Company; secretary and treasurer, F. H. Dodge, Ohio Electric Car Company; executive committee, G. D. Fairgrave, Anderson Electric Car Company; H. H. Rice, Waverley Electric Company; C. F. L. Wieber, Rauch & Lang Carriage Company.

**The F. W. Spacke Company**, Indianapolis, Ind., maker of motorcycle motors, has added a new department for the production of motors and parts specially adapted to cyclecars. F. E. Lawrence has been appointed to represent the company in Detroit.

**A. S. Robinson**, formerly sales manager of the Kissel-Kar branch in Los Angeles, Cal., has succeeded the late E. Rogers Stearns as branch manager.

**The Firestone Tire & Rubber Company**, Akron, O., maker of Firestone tires and rims, had gross earnings of \$15,000,000 during the fiscal year recently ended, as

## GARAGE AND DEALER.

**The George Grow Automobile Company**, Boston, Mass., one of the largest dealers in slightly used motor cars and trucks in New England, has removed into new and larger quarters in the five-story building known as the Electric garage, 321-323 Columbus avenue. It will occupy the entire structure as a salesroom and service station.

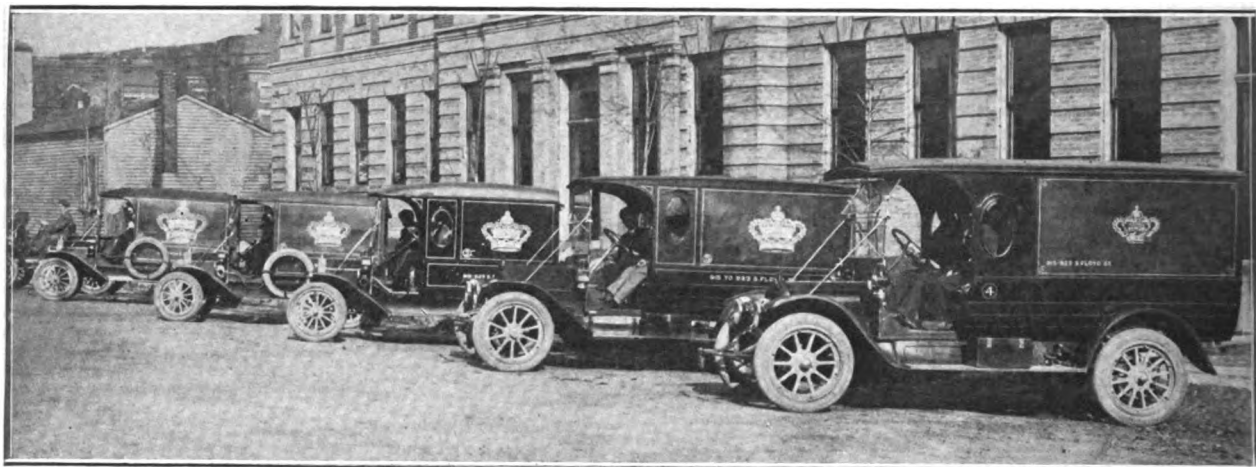
**Fred W. Dart**, Hartford, Conn., has secured the Oldsmobile agency for the Palace Auto Station.

**The Drummond Auto Company**, Omaha, Neb., agent for Locomobile and Woods electric pleasure cars and Chase and G. M. C. trucks, has changed hands, the new officials being: President, J. W. Griffith; vice president and general manager, F. W. Bacon; secretary and treasurer, W. L. Griffith.

**The Providence Motor Car Company**, Snow and Washington streets, Providence, R. I., agent for Maxwell and Velie cars, and Ajax tires, is issuing to the local public an interesting letter calling attention to the attractive features of the Maxwell line for 1914.

**M. J. Mitchell**, Vancouver, B. C., after a visit to the factory of the Cartercar Company, Pontiac, Mich., has organized the Cartercar British Columbia Company to handle the distribution of Cartercars in that territory. Associated with him in the enterprise is his brother, W. M. Mitchell. The salesrooms will be located at 723 View street, Victoria.

**The Gibney Tire & Rubber Company**, Boston, Mass.,



## Crown Laundry Company, Louisville, Ky., Is Only Concern of Its Kind with Completely Motorized Equipment.

compared with \$11,500,000 for the preceding year. Net profits were \$1,600,000, and the surplus, \$1,250,000. The balance sheet shows current assets of about \$7,000,000.

**The Mitchell-Lewis Motor Company**, Racine, Wis., has elected the following officers: President and general manager, Beach L. McClaren; first vice president and general factory manager, William T. Lewis; treasurer, F. L. Mitchell; secretary, H. E. Redman; general sales manager, O. C. Friend; purchasing agent, G. W. Morgan; general counsel, M. J. Gillen.

**The Motor & Manufacturing Company**, Dunkirk, N. Y., has awarded contracts for the erection of a new plant, comprising one two-story structure, 57 by 85 feet, and a one-story building, 30 by 84 feet.

**Arthur A. O'Neill** has been appointed eastern sales manager for the Empire Automobile Company, Indianapolis, Ind., and will make his headquarters in Boston, Mass.

**C. F. Brockus**, superintendent of the Studebaker plant No. 4 in Detroit, has been promoted to a new position, recently created, in which he will have to do with the specialization of manufacturing methods.

**The Edward F. Gerber Company**, Pittsburg, Penn., is understood to have made arrangements to take over the business of the Michigan Motor Car Company and the Michigan Buggy Company, Kalamazoo, Mich., which recently met with financial reverses. It is expected that the headquarters will be located in Pittsburg and that the factory in Kalamazoo will be continued as a manufacturing proposition.

will shortly open a branch establishment on Brookline street, near Beacon street.

**Hewitt & Son**, Hillsdale, Mich., has sold its garage to George Frost, Montgomery, Mich.

**The King Motor Car Company**, Detroit, has opened a branch agency at 1089 Boylston street, Boston, Mass.

**John L. Hammond**, formerly with the Eagle Oil & Supply Company, Boston, Mass., has been appointed manager of the new Boston branch of the Endurance Tire & Rubber Company, New York City.

**Russell H. Erskine** and Frederick N. Burr, Meriden, Conn., who have been operating the automobile station on East Main street in that city, have dissolved partnership. With Herbert Baldwin, Mr. Erskine will continue the business under the firm name of the Central Garage Company.

**A. C. Rose** of the automobile department of Brown, Thomson & Co., Hartford, Conn., has returned from a visit to Detroit, where he inspected many of the new 1914 models.

**Henry A. Brandtjen** has purchased the business of the St. Paul Motor Vehicle Company, 50 East Fourth street, St. Paul, Minn., and will handle the agencies for the Haynes, Lozier and Fiat cars.

**The Dayton Buick Company**, Dayton, O., has been organized with capital of \$10,000 to handle the sale of Buick cars, made by the Buick Motor Company, Flint, Mich., in northern Ohio. The officers of the new company are: President, L. J. Haughey; vice president, Joseph A. McKenney; secretary-treasurer, A. J. Smith.



## RECENT PATENTS.

**Pressure Gauge**, Harutun B. Azadian, Syracuse, N. Y., assignor to Akabl R. Azadian of the same place. No. 1,072,415. Filed May 20, 1909.

**Automobile Light Shifter**, John G. Becker, Campbell, Mo. No. 1,072,418. Filed Jan. 30, 1913.

**Float**, Ernest D. Broderick, Detroit. No. 1,072,420. Filed Aug. 23, 1911.

**Lubricant Retaining Means**, Alexander T. Brown, assignor to the Brown-Lipe Gear Company, Syracuse, N. Y. No. 1,072,421. Filed Jan. 11, 1911.

**Spring Wheel**, William T. Crawford-Frost, Baltimore, Md. No. 1,072,433. Filed Oct. 2, 1911.

**Control Lever**, William C. Durant, Detroit, assignor to the Chevrolet Motor Company of the same place. No. 1,072,438. Filed April 4, 1912.

**Tire Protector**, Silas S. Huffman and Dur A. Huffman, Youngstown, O. No. 1,072,464. Filed March 13, 1913.

**Wrench**, Frederick Newell Martindale, Spraguesville, N. Y. No. 1,072,479. Filed Dec. 21, 1912.

**Carburetor**, George S. Pierson, Kalamazoo, Mich. No. 1,072,492. Filed July 28, 1913.

**Vehicle Wheel**, Charles Schwartz, Philadelphia. No. 1,072,515. Filed Oct. 5, 1912.

**Device for Tire Chains**, John A. Staples, Newburgh, N. Y. No. 1,072,522. Filed Oct. 5, 1912.

**Electrical Measuring Instrument**, Ray L. Triplett, Bluffton, O., assignor by mesne assignments to the Dillon Manufacturing Company of the same place. No. 1,072,531. Filed Nov. 28, 1910.

**Wrench**, Frederick Waldner, Alexandria, S. D. No. 1,072,535. Filed April 22, 1913.

**Electric Battery**, David H. Wilson, Chicago. No. 1,072,551. Filed Sept. 18, 1905.

**Spark Plug Terminal Connector**, Charles W. Beck, Rockville Centre, N. Y., assignor by mesne assignments to the Michigan Motor Specialties Company of the same place. No. 1,072,561. Filed Oct. 15, 1910.

**Carburetor**, Joseph Brautigam, Detroit, assignor by mesne assignments of one-half to Frank A. Rolf of the same place. No. 1,072,565. Filed July 5, 1912.

**Valve Operating Mechanism**, Herbert Benjamin Briggs, Tacoma, Wash. No. 1,072,566. Filed Oct. 28, 1911.

**Anti-Skidding Device**, Charles W. Cramer, Scranton, Penn. No. 1,072,579. Filed May 11, 1911.

**Vehicle Spring Device**, Robert L. Donlan, Seattle, Wash. No. 1,072,586. Filed March 7, 1912.

**Heater for Radiators**, William Gallagher, St. Louis, Mo. No. 1,072,595. Filed April 28, 1913.

**Automobile Heating Device**, Frederick J. Moore, Brooklyn, N. Y., assignor of one-half to Philip Howard Reid, Sheepshead Bay, N. Y. No. 1,072,635. Filed March 20, 1913.

**Acetylene Welding Process**, George C. Schemmel, Wapakoneta, O. No. 1,072,655. Filed July 29, 1912.

**Nut Lock**, Frank Smith, Quick, W. Va. No. 1,072,666. Filed Aug. 7, 1912.

**Gas Engine Governor**, Frank G. Burghoffer, Bellingham, Wash. No. 1,072,696. Filed Aug. 28, 1912.

**Resilient Vehicle Tire**, John T. Clark, Provo, Utah. No. 1,072,699. Filed Nov. 8, 1911.

**Automobile Street Cleaner**, David Gaul, Los Angeles, Cal. No. 1,072,713. Filed Feb. 23, 1912.

**Carburetor**, Robert W. Kaltenbach, Cleveland, O., assignor of one-half to Ernest J. Kaltenbach, Brooklyn, N. Y. No. 1,072,733. Filed May 31, 1912.

**Two-Cycle Engine**, Horatio H. Newman, Sandersville, Ga. No. 1,072,766. Filed Aug. 12, 1912.

**Shock Absorber**, Adolph Peteler, New York City. No. 1,072,770. Filed Feb. 20, 1912.

**Gauge for Fuel Tanks**, Philip M. Bush, Hartford, Conn., assignor to the Bush Manufacturing Company of the same place. No. 1,072,819. Filed Dec. 5, 1911.

**Automatic Safety Brake**, Lee G. Eggers, Mount Lebanon, Penn., assignor to Zeffie M. Eggers of the same place. No. 1,072,841. Filed Aug. 26, 1912.

**Carburetor Mechanism**, Milton L. Sammons, Kansas City, Mo. No. 1,072,875. Filed May 29, 1913.

**Gauge for Fuel Tanks**, Edward S. Savage, Rochester, N. Y. No. 1,072,876. Filed July 31, 1912.

**Tire Support**, Louis Cadwell, New York City. No. 1,072,909. Filed March 3, 1913.

**Tire**, Ora Dimmitt, Green Castle, Mo. No. 1,072,925. Filed Feb. 5, 1912.

**Double Acting Wrench**, Robert Owen, Jr., Shawnee, O. No. 1,072,980. Filed Feb. 3, 1913.

**Vehicle Wheel**, Jorge Guerrero, Paris, France. No. 1,073,040. Filed Dec. 26, 1911.

**Spark Plug**, Edwin C. Henn, Cleveland, O. No. 1,073,048. Filed Jan. 4, 1912.

**Safety Crank**, John O. Stanley, Holyoke, Mass. No. 1,073,058. Filed Sept. 28, 1912.

## COMING EVENTS.

## September.

Sept. 26-27—Track races, Peoria, Ill.  
Sept. 26-29—Convention, State Firemen's Association, New Bedford, Mass.

Sept. 27—Track races, White Plains, N. Y.

Sept. 27—Track races, San Marcos, Tex.

Sept. 27—Track races, Kalamazoo, Mich.

Sept. 27-28—Track races, Bakersfield, Cal.

Sept. 28—Hill climb, Mont Verdun, France.

Sept. 29-Oct. 4—American Road Congress, Detroit, Mich.

## October.

Oct. 3—Track races, Trenton, N. J.

Oct. 3-4—Track races, Oklahoma City, Okla.

Oct. 4—Track meet, Fresno, Cal.

Oct. 4—Reliability tour, St. Louis, Mo.

Oct. 4-11—Around Lake Michigan tour, Chicago, Ill.

Oct. 6-18—Show, St. Louis, Mo.

Oct. 11—Track races, Springfield, Ill.

Oct. 12-17—Convention, American Institute of Metals, Chicago, Ill.

Oct. 12-17—Convention, Carriage Builders' National Association, St. Louis, Mo.

Oct. 13-18—National fire prevention conference, Philadelphia, Penn.

Oct. 15-25—Electrical Show, Grand Central Palace, New York.

Oct. 17-27—Automobile Salon, Grand Palais, France.

Oct. 18-19—Track races, St. Louis, Mo.

Oct. 24—Convention, American Iron & Steel Institute, Chicago, Ill.

Oct. 27-28—Convention, Electric Vehicle Association of America, Chicago, Ill.

## November.

Nov. 2-3—Road race, El Paso, Tex.-Phoenix, Ariz.

Nov. 3-8—Motorcycle show, Coliseum, Chicago, Ill.

Nov. 4-5—Road race, Los Angeles, Cal.-Phoenix, Ariz.

Nov. 4-5—Road race, San Diego, Cal.-Phoenix, Ariz.

Nov. 6—Track races, Phoenix, Ariz.

Nov. 8-12—Track races, Shreveport, La.

Nov. 7-15—Olympia Show, London, England.

Nov. 8-15—Show, Atlanta, Ga.

Nov. 24—Vanderbilt Cup race, Savannah, Ga.

Nov. 27—Grand Prize race, Savannah, Ga.

## December.

Dec. 1-3—Annual meeting, American Automobile Association, Richmond, Va.

Dec. 9-12—Convention, American Road Builders' Association, Philadelphia, Penn.

Dec. 10-12—Convention, Retail Implement & Vehicle Dealers' Association, Milwaukee, Wis.

Dec. 11-20—International exposition of safety and sanitation, American Museum of Safety, New York City.

## January.

Jan. 2-10—Importers' Salon, Hotel Astor, New York City.

Jan. 3-10—Pleasure car show, Grand Central Palace, New York City.

Jan. 24-31—Pleasure car show, Coliseum, Chicago, Ill.

Jan. 26-31—Show, Scranton, Penn.

Jan. 31-Feb. 7—Show, Minneapolis, Minn.

## February.

Feb. 2-7—Pleasure car show, Buffalo, N. Y.

Feb. 9-14—Truck show, Buffalo, N. Y.

Feb. 22-27—Show, Omaha, Neb.

Feb. 22-March 5—Show, Cincinnati, O.

Feb. 24-28—Show, First Regiment Armory, Newark, N. J.

## March.

March 7-14—Pleasure car show, Mechanics' Building, Boston, Mass.

March 17-21—Truck show, Mechanics' Building, Boston, Mass.



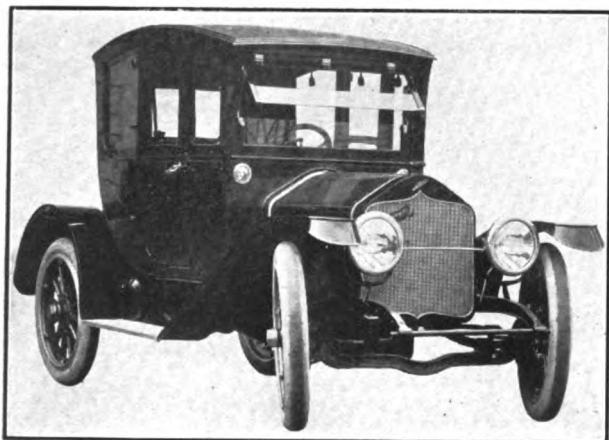
## RECENTLY ANNOUNCED 1914 MODELS.

**T**HE list of six-cylinder machines is being increased very materially in the announcements of new models now being made. Some of the latest features in design and construction are to be found in the following brief statements, which include only the more important changes, as indicated by the information made public by the manufacturers:

**National**—National Motor Vehicle Company, Indianapolis, Ind. Coupe shown in accompanying illustration, added to series V-3 as previously announced.

**Pullman**—Pullman Motor Car Company, York, Penn. Model 6-46. Remainder of the line continued. New light six-cylinder has unit power plant with bore of 3.75 inches and stroke of 5.25. Four-speed transmission with Vulcan electric gearshift. Extra long, flat front springs; three-quarter elliptic rear. Wire wheels.

**Havers**—Havers Motor Car Company, Port Huron, Mich. Two six-cylinder models, continued from last season with but few changes, except in body design. Larger car known as 6-60, has motor with five-inch bore and



Attractive Coupe Added to National Series V-3.

5.25-inch stroke, instead of four by 4.25. Elsemann magneto. North East starting and lighting system. Equipment very complete. Wire wheels optional.

**Marathon**—Marathon Motor Works, Nashville, Tenn. Distributor Herff-Brooks Corporation, Indianapolis, Ind. Champion, Winner and Runner models continued, each with touring car and roadster bodies. Improvements largely in body design. Champion and Winner equipped with electric lighting and starting. Champion motor, 4.5 by 5.125; Winner, 4.25 by 4.5; Runner, 3.5 by 4.5.

**Palge**—Palge-Detroit Motor Car Company, Detroit. Models 25 and 36 continued with changes mostly in nature of refinements. Larger chassis comes completely equipped with Gray & Davis electric starting and lighting system; smaller supplies this at an extra charge. Both have unit power plants; model 25 motor, 3.75-inch bore and four-inch stroke; model 36, four by five inches. Both are of the L head type, with cylinders cast en bloc.

**Buick**—Buick Motor Company, Flint, Mich. Model B55. Six-cylinder touring car and roadster. Supplements new four-cylinder models, and like them has left hand drive with centre control, and the Delco combination electric lighting, starting and ignition system. Motor retains characteristic Buick overhead valves, and has bore of 3.75 inches and stroke of five, being rated by the maker at 48 horsepower. All Buicks are controlled by a single lever, operating on the ball and socket joint.

**Hupmobile**—Hupp Motor Car Company, Detroit. One chassis fitted with five-passenger touring, six-passenger touring, two-passenger roadster and three-passenger inside driven coupe bodies. At option, all models are fitted with Westinghouse starting and lighting system, except the coupe, which has the starter only. With cars fitted with the starter, tires are carried at the rear. Changes largely in the nature of minor improvements. New and larger gasoline tank in cowl dash, with reserve tank built into the gasoline chamber. Magneto is provided with a rain shield.

**Speedwell**—Speedwell Motor Car Company, Dayton, O. Series H. Six-cylinder chassis with seven-passenger body. Few mechanical changes. Unit power plant. Bosch dual ignition system. Electric lighting and starting system. Left hand drive, centre control. Equipment includes: Electric horn, Warner speedometer, power air pump, Yale lock on gearshift lever, emergency gasoline supply, tire carrier of improved type, windshield integral with body, concealed tool box, and lockers under cowl. McCue wire wheels offered at an option. Either 36 by 4.5 or 37 by five-inch tires.

**Stutz**—Stutz Motor Car Company, Indianapolis, Ind. Series E. Two chassis. E 4, four-cylinder; E 6, six-cylinder; both fitted with two-passenger, six-passenger touring and coupe bodies. Motors very much alike and both fit under the same hood. Four has bore of 4.75 inches and stroke of 5.5; six is four by five, instead of 4.25 by five as with the older six. Both are of the T head type. Four cast in pairs; six, in threes. Water jacketed intake manifold. New style of breather pipe. Individual pushrod enclosure. Clutch changed from multiple disc to cone. Electric motor starter designed by Harry Stutz and built by the Remy Electric Company. Wire wheels are offered at an option. Tires, 34 by 4.5 inches all around.

**Packard**—Packard Motor Car Company, Detroit. Model 38. Two types of chassis, touring and phaeton, and 19 body styles. Changes include worm bevel gear drive, recently announced, and the following: Cylinders cast in threes. Siamese exhaust manifold with separate passage for each set of cylinders. New oiling system; all piping within crankcase and camshaft drilled to carry oil. Bosch duplex ignition system; all wiring enclosed within a compartment in unit with the water outlet manifold. Bijur electric lighting and starting system. Wheelbase increased to 140 inches. Shape of rear axle altered. Rear springs slung under axle. Brake drums increased to 17 inches diameter; brake cross shafts mounted on axle housing; brake rods within chassis. Plate clutch brake instead of band. New gearshift, eight inches further forward to allow left side entrance; new door on drive side. Tapering hood and cowl to conform. Tires carried at the rear on all models.

**Moon**—Moon Motor Car Company, St. Louis, Mo. Light six-50 Streamline. Motor differs from new model 42 four-cylinder engine in being of the L head type. Cylinders cast in threes. Bore, 3.75 inches; stroke, 5.25. Maker's rating, 58 horsepower at 1800 revolutions. Multiple disc clutch. Four speeds forward and reverse, direct drive on the third. Full floating rear axle. Wheelbase, 129; tread, 56 or 60. Tires, 35 by 4.5 inches. Weight, 3840 pounds. Delco electric light, starting and ignition system. Motor tire pump. Two types of bodies, both of the streamline design, one seating five, and the other six or seven. Also, new Moon coupe on four-cylinder chassis. Motor T head, cast in pairs, 4.5-inch bore, five-inch stroke. Three-speed transmission. Body fitted with sashless windows, extra wide driving seat and special compartment for storing spare tires.

**Davis Cyclecar**—Davis Cyclecar Company, Detroit, Mich. Special Spacke motor. Three-speed transmission. Wheelbase, 96 inches; tread, 36; weight, 600 pounds. Two passengers, seated tandem.

**DeCross Cy Car**—DeCross Cy Car Company, Cincinnati, O. Cyclecar. Motor, two-cylinder, air-cooled, 9-12 horsepower. Magneto ignition. Friction transmission. No differential. Ash frame. Wire wheels. Twenty-eight by 2.75-inch tires. Tread, 36 inches; road clearance, 10 inches.



**OPENS GALVESTON BRANCH.****H. W. Johns-Manville Company Now Has Three Offices in Lone Star State.**

Believing that the steadily increasing trade with Central and South America makes Galveston, Tex., a convenient point of distribution of its products, the H. W. Johns-Manville Company, New York City, has opened a new branch in that city. This comprises a modern brick warehouse of large proportions, and a salesroom and office for the distribution of stock in the southwest, as well as to the foreign trade.

This company is among the country's largest houses dealing in roofing, building materials, packings, pipe coverings, insulating materials and electrical goods. It owns extensive asbestos mines in Danville, Que., and has nine factories located in various cities throughout the United States. The opening of the Galveston branch makes three offices in the Lone Star State, the others being at Houston and Dallas.

**AN ELABORATE CIRCULAR.****B. F. Goodrich Company Issues Attractive Illustrated Sheet for Dealers.**

An unusually attractive and elaborate specimen of engraving and printing is noted in the circular issued recently by the B. F. Goodrich Company, Akron, O., which is being mailed to every dealer in the country. Some idea of the circular may be obtained from the dimensions, which are 42.5 by 31 inches, and the cost of the half-tone utilized on one side is said to have been \$500.

The circular was compiled to show the magnitude of the Goodrich service and advertising, and as it is unfolded, a typewritten message in letters nearly .25 inch high meets the eye with a greeting from E. C. Tibbets, the advertising manager of the company.

The illustration on the inside of the circular is a map of the United States, overlaid with reduced specimens of recent advertisements of the Goodrich company which have appeared in maga-


zines, newspapers, trade publications, etc. The location of each Goodrich branch in America is noted by a tiny tire with a black centre, upon which the name of the city is shown in white. Directly underneath the reproduction of the map, utilizing space left by the irregularity of the southern boundary and coastlines, are pictures of the Goodrich Paris factory and London branch.

The circular is printed in four colors and illustrates booklets and other co-operative methods utilized to stimulate interest on the part of dealers, etc., and is the result of the company's organization working in harmony with that of the Mahin Advertising Company of Chicago.

**INVADER OIL PROMOTIONS.****Plowman and Curtis Receive Appointments as Branch Managers.**

Following the announcement of E. A. Scheu's appointment as general manager and sales manager of the Invader Oil Company, with headquarters in New York City, considerable interest has developed in learning the name of the man who would succeed Mr. Scheu as manager of the Boston branch. The selection has fallen upon H. T. Curtis, who has been identified with the oil business for a number of years, having been associated with the old Havoline Oil Company, and later with the Wolverine Lubricants Company.

In connection with this appointment comes the information that Howard M. Plowman, who has been covering the Long Island territory for this company, has been promoted to become manager of the Philadelphia branch. Like Mr. Curtis, Mr. Plowman has seen long service with both the Havoline Oil Company and the Wolverine Lubricants Company.

|   |                                      |          |         |
|---|--------------------------------------|----------|---------|
|  | 6 Cylinders, 4 1-2x7                 | MODEL 77 | \$6,000 |
|   | 6 Cylinders, 4 1-2x5 1-2             | MODEL 66 | \$5,000 |
|   | 6 Cylinders, 4x5                     | MODEL 55 | \$4,000 |
|   | Some desirable territory still open. |          |         |
| AUSTIN AUTOMOBILE CO.   |                                      |          |         |
| Grand Rapids, Mich.   |                                      |          |         |



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INDIANAPOLIS, IND.


ALWAYS SPECIFY

**HOYT METERS**

AND GET YOUR MONEY'S WORTH

**HOYT ELECTRICAL WORKS**

PENACOOK, NEW HAMPSHIRE





# The "Black Eagle" Spark Plug

PATENTED

## 50 Cents Is Enough

The "Black Eagle" Spark Plug has made good because it was designed and manufactured with this result in view.

A person in close touch with the supply and manufacturing ends of the trade was a visitor at our factory recently, and was shown the details of construction, including the machinery, testing, and assembling of the "BLACK EAGLE" Spark Plug. What he said we believe will be of interest to you, as it indicates the effort on our part to supply a high grade plug at a reasonable price. We therefore quote below his impressions.

"I am simply amazed at the workmanship, material, and construction of the 'BLACK EAGLE' Spark Plug. When I saw this plug advertised at a price of 50c to the consumer, I naturally supposed it was a cheap, common, plug such as you occasionally find in jobbing houses on the bargain counter. I am convinced, after seeing these plugs tested, and examining minutely the machine parts which enter into their construction, that no better porcelain spark plug is offered by any one, regardless of the price they ask."



We are not influenced by what our competitors charge for spark plugs! We have ignored price precedent, for the reason that a high grade spark plug can be manufactured and sold at 50c each, and that is enough.

Sent prepaid on receipt of price. Made in all standard threads.

### THE STANDARD CO.

### Torrington, Conn., U. S. A.

Pat. Europe.

Pat. America



Showing M&M Attached with 1/4" Elbow.

## TRY THE M&M ECONOMIZER FOR SPEED, POWER AND ECONOMY

### HOW ABOUT THIS LETTER!

The M&M Sales Company, Lewistown, Pa.: Auburn, N. Y., August 14th, 1918.  
Gentlemen:—I am much pleased with the M&M Economizer that I put on my REO touring car a few weeks ago. I am using a carburetor, which gives a very high mileage per gallon, but with the use of your Economizer I get several more miles per gallon, thereby making a marked saving in gasoline.

It also entirely eliminates the use of brakes, except on very steep grades, which saves much wear on brakes, and I believe is a saving on tires also. It takes a few days' practice to become familiar with the use of the Economizer, but any one will be well paid for his trouble in learning to use it. I would not part with mine for several times the price and cost of installing.  
Yours very truly,  
(Signed) F. LEE RODGERS.

WHAT COULD BE MORE CONVINCING THAN THE ABOVE LETTER! ALSO, the M&M is guaranteed to do just what we claim, and if it proves unsatisfactory within thirty days, YOUR MONEY WILL BE REFUNDED. (Reference—Citizens National Bank, Lewistown, Pa.)

The M&M is guaranteed to save from 40 to 50% of gasoline, and increase the speed and power 20% with less gasoline, and less carbon. It is the only known carburetor adjuster on the market, and RANKS FIRST AS A CARBON ELIMINATOR. For priming the motor, you cannot find its equal. PLEASE BEAR IN MIND—THERE IS NO SCREEN, or any other obstacle placed in the manifold, as this will have a tendency to CLOG THE MANIFOLD, and make it more difficult for the motor to absorb the gas and air.

Price of the M&M—\$3.50 and 17c extra for postage. We include either friction foot pedal, or steering post control, which consists of flexible shaft and wire. Requires 3/4" pipe tap. Elbow will be furnished upon request.

PRICE OF THE MOTORCYCLE SIZE—\$1.25 Prepaid. Size 1/4".

THE M&M ECONOMIZER IS "THE PATENTED ONE." Warning to users, makers and dealers, PATENT NO. 922,528—May 25, 1909.

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### THE M & M SALES COMPANY, Dept. A

Main Office and Factory, Lewistown, Pa.

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Guaranteed for 3000 Miles  
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It costs less than a new tire.

Write for particulars

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 Ward Leonard Starter and Generator  
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See the KING—then buy! It's fairness to yourself. You can't afford to purchase *any* car until this highest of motor values has been investigated. The KING gives *more* service, comfort, style, and convenience than can be had in any car near its price, and has desirable, patented features which *no other* car can offer.

## FEATURES OF MODEL B, 30-35 HORSE-POWER

*Two Styles—One Chassis—Touring Car and Roadster*

Cantilever Rear Springs  
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Three-point Suspension  
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Rain-vision Ventilating Windshield; Silk Mohair Top; Quick-attachable Curtains; Quick-detachable Rims; Stewart Warner Speedometer (listed \$50); Electric Horn; Extra Rim; Tire-irons; Pump; Jack; Tire-repair Outfit; Tools, etc., all in regular equipment

*The first car run on the streets of Detroit was made by Chas. B. King, nineteen years ago.*

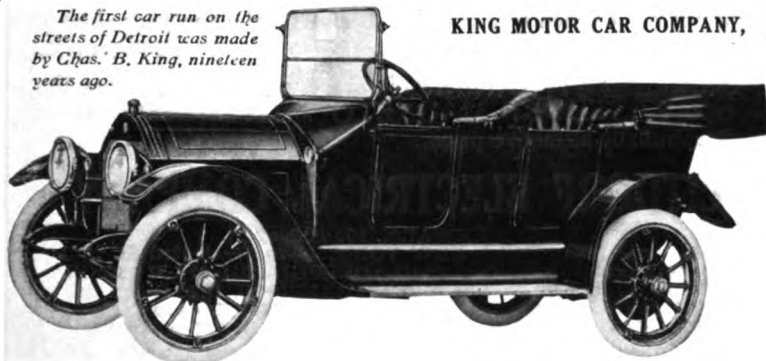
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 Broadway at 53d St.

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AGENCY FOR CANADA  
 King Motor Sales Co. of Canada,  
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ATTENTION, AGENTS! Every KING sold sells others. If we could show the KING to every prospective purchaser of a moderate-priced car, we could sell a year's output monthly. In service and style, it far exceeds any car of its class. Write or wire today for territory.



Your tire troubles are over if your car  
 is equipped with  
**Dayton Airless Tires**

Send for "Catechism"; shows you how motoring  
 expense can be cut down and motoring pleasure increased.

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## J. M. Shock Absorber



Its efficiency is proved by scientific facts—not mere claims. Write for Ovington Data D. to *The J. M. Shock Absorber Co.*, 210 S. 17th Street, Philadelphia. Branches in Boston, Hartford, Providence, and all leading cities

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 United States Rubber Bldg.  
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If your dealer hasn't them send us his name and we'll see that you are supplied.

**BURN-BOSTON BATTERY,** 19 Doane St. BOSTON, MASS.



The Thoroughbred Car.

Live wire dealers, write for unallotted territory.

**HERRESHOFF MOTOR COMPANY, Detroit, Mich.**

Electric self-venting, electrically lighted.  
 Four Forward Speeds.

"Six Thirty-Six" Touring  
 Car and Roadster - \$1850  
 Model 30 Touring Car - \$1350  
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QUALITY **HARRIS** BEST FOR  
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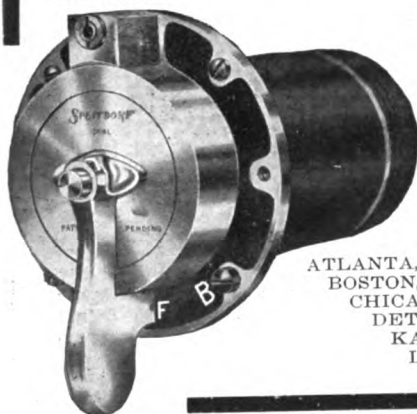
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"Always There"

The SPLITDORF "TS" TRANSFORMER—the best transformer on the market today—is a vital addition to any car, if you would have ignition snap and certainty.

YOU can have your car equipped with this new style transformer to work in connection with the SPLITDORF MAGNETO on YOUR CAR.

In its special windings a large margin of safety against electrical breakdowns is provided. In its general construction no detail has been overlooked to insure an instrument that can always be depended upon for service.



The "TS" is interchangeable with any type transformer, tube or dash coil and can be attached to any car. We will make you a very liberal allowance on your old coil in exchange for one of the new transformers.

You can also have your entire ignition system exchanged for the latest type SPLITDORF MAGNETO and TRANSFORMER at an exceptionally attractive price.

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Reliable at all times

Full information for the asking

THE APPLE ELECTRIC COMPANY  
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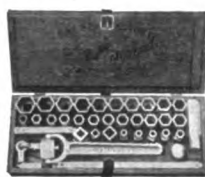
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will dissolve in the water and stop that leak in the radiator or water jacket

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Bay State Autokit, No. 1, \$10

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**Hopewell Brothers**, Newton, Mass.  
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**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.  
**Miller, Chas. E.**, 97-103 Reade St., New York.  
 Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 259 Peachtree St., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.  
**Milwaukee Auto Specialty Co.**, 128 Second St., Milwaukee, Wis.  
**Motor Parts Co.**, 185-187 Columbus ave., Boston; 818 No. Broad St., Philadelphia; Springfield, Mass.  
**Northwestern Chemical Co.**, Marietta, O.  
**Waite Auto Supply Co.**, 81 Exchange place, Providence.

#### ACETYLENE TANKS. (See Tanks.)

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#### AIR COMPRESSORS AND TANKS.

**Williams Foundry & Machine Co.**, Akron, O.

#### AMMETERS AND VOLTMETERS.

**Hoyt Electrical Instrument Works**, Penacook, N. H.

#### AUTO LOCKS. (See Locks.)

#### AUTOMOBILES. (See Cars.)

#### AUTOMOBILE SPECIALTIES.

**Cox Brass Mfg. Co.**, Dudley Ave., Albany, N. Y. (Brass Goods.)

**Motor Specialties Co.**, 2 Cooper Lane, Waltham, Mass.  
**Sumner, George, Inc.**, 1926 Broadway, New York.

#### BALLS AND BALL BEARINGS.

**Boyd, F. Shirley**, 903 Boylston St., Boston. (R. I. V.)  
**Brets Co., J. S.**, 250 W. 54th St., New York. (F. & S.)  
**Hyatt Roller Bearing Co.**, Detroit.  
**Marburg Bros., Inc.**, 1790 Broadway, New York. (S. R. O.)  
**New Departure Mfg. Co.**, Bristol, Conn.  
**R. L. V. Co.**, 1771 Broadway, New York. (R. I. V.)

#### BATTERIES.

**Burn-Boston Battery Co.**, 19 Doane St., Boston.  
**Electric Storage Battery Co.**, Philadelphia. (Exide.)  
**Gelsner Bros. Storage Battery Co.**, 514 W. 57th St., New York.  
**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City. (J-M.)  
**Waite Auto Supply Co.**, 81 Exchange place, Providence. (Success.)  
**Willard Storage Battery Co.**, 5716 Euclid Ave., Cleveland. (LBA Lighting and Starting.)  
 Branches: 136 West 52nd St., New York; 1191 Woodward Ave., Detroit; 2241 Michigan Ave., Chicago; 243 Monadnock Bldg., San Francisco.

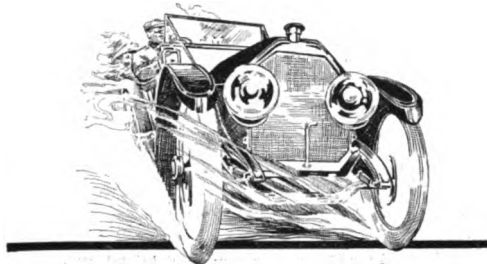
#### BATTERY EXTINGUISHERS.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.

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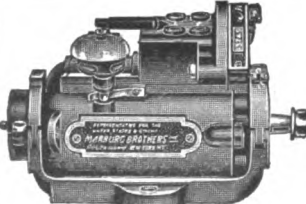
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**(BUYERS' GUIDE—Continued.)****BODIES, TRUCK.**

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**Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.**

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**Sager Co., J. H., 271 South Ave., Rochester, N. Y.**

**CABLES. (See Wires.)**

**CARBON REMOVERS. (See Cylinder Cleaning Compound.)**

**CARBURETORS.**

**Planhard Mfg. Co., 1790 Broadway, New York. (Planhard.)**

**CARS—ELECTRIC PLEASURE.**

**Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)**

**Baker Motor Vehicle Co., Cleveland. (Baker.)**

**CARS—GASOLINE PLEASURE.**

**Abbott Motor Co., 141 Waterloo St., Detroit. (Abbott-Detroit.)**

**Austin Automobile Co., Grand Rapids, Mich. (Austin.)**

**Cartercar Co., Pontiac, Mich. (Cartercar.)**

**Cole Motor Car Co., Indianapolis, Ind. (Cole.)**

**Empire Automobile Co., Indianapolis, Ind. (Empire, Little Aristocrat.)**

**Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)**

**Henderson Motor Car Co., Indianapolis. (Henderson.)**

**Herreshoff Motor Co., 620 Harper Ave., Detroit. (Herreshoff.)**

**Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)**

**Keeton Motor Co., Detroit. (Keeton.)**

**Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)**

**Knox Automobile Co., Springfield, Mass. (Knox.)**

**K-R-I-T Motor Car Co., Detroit. (K-R-I-T.)**

**Maxwell Motor Co., Inc., Detroit. (Maxwell.)**

**Mercer Automobile Co., 1100 Whitehead Road, Trenton, N. J. (Mercer.)**

**Michigan Motor Car Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)**

**National Motor Vehicle Co., 1033 22d St., Indianapolis. (National.)**

**Nordyke & Marmon Co., Indianapolis. (Marmon.)**

**Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)**

**Palge-Detroit Motor Car Co., Detroit. (Palge.)**

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## (BUYERS' GUIDE—Continued.)

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)  
 Reo Motor Car Co., Lansing, Mich. (Reo.)  
 Speedwell Motor Car Co., 80 Essex Ave., Dayton, O. (Speedwell.)  
 Stutz Motor Car Co., Indianapolis. (Stutz.)  
 White Co., The, 828 E. 79th St., Cleveland. (White.)  
 Branches: 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.  
 Willys-Overland Co., Toledo, O. (Overland.)

## CARS—STEAM PLEASURE.

White Co., The, 828 E. 79th St., Cleveland. (White.)  
 Branches: See Cars—Gasoline Pleasure.

## CARS—GASOLINE COMMERCIAL.

Adams Bros. Co., Findlay, O. (Adams.)  
 Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)  
 Blair Mfg. Co., Newark, O. (Blair.)  
 Brown Commercial Car Co., Peru, Ind. (Brown.)  
 Cartercar Co., Pontiac, Mich. (Cartercar.)  
 Dart Manufacturing Co., Waterloo, Ia. (Dart.)  
 Driggs-Seabury Ordnance Corp., Sharon, Penn. (Vulcan.)  
 Federal Motor Truck Co., Junction and Leavitt Sts., Detroit. (Federal.)  
 Garford Co., Elyria, O. (Garford.)  
 General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)  
 Branches: New York, Chicago, Boston, Philadelphia, Kansas City.  
 Gramm-Bernstein Co., Lima, O. (B. A. Gramm's.)  
 Knox Automobile Co., Springfield, Mass. (Knox and Martin Tractor.)  
 Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)  
 Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)  
 Reo Motor Car Co., Lansing, Mich. (Reo.)  
 Sullivan Motor Car Co., 1707 East Ave., Rochester, N. Y. (Sullivan.)  
 Willys-Overland Co., Toledo, O. (Overland.)

## CARS—ELECTRIC COMMERCIAL.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)  
 Atlantic Vehicle Co., Factory, Newark, N. J.; 1600 Broadway, New York City; 10 Postoffice Sq., Boston. (Atlantic.)  
 Baker Motor Vehicle Co., Cleveland. (Baker.)  
 Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)  
 Branches: 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.  
 General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)  
 Branches: See Cars—Gasoline Commercial.  
 General Vehicle Co., Long Island City, N. Y. (G. V.)

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Cartercar Co., Pontiac, Mich. (Cartercar.)  
 Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)  
 Branches: See Cars—Electric Commercial.  
 Knox Automobile Co., Springfield, Mass. (Knox and Martin Tractor.)  
 White Co., The, 828 E. 79th St., Cleveland. (White.)  
 Branches: See Cars—Gasoline Pleasure.  
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## CATALOGUE SYSTEMS.

Catalogue Systems Co., Fisher Bldg., Chicago, Ill.  
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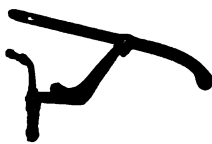
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Boyd, F. Shirley, 903 Boylston St., Boston. (Baldwin.)  
Miller, Chas. E., 97-103 Reade St., New York. (Bramp-ton.)  
Branches: See Accessory Manufacturers and Jobbers.)

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Boston Clock Co., 16 State St., Boston.  
Chelsea Clock Co., 16 State St., Boston.

### CLUTCHES—AUTOMOBILE FRICTION.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford Cone.)

### COILS.

Heinze Electric Co., Lowell, Mass.  
New York Coil Co., 338 Pearl St., New York City.

### CONTROLLERS AND ECONOMIZERS.

M&M Sales Co., Lewistown, Penn. (M&M.)

### CYLINDER CLEANING COMPOUND.

Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.  
Milwaukee Auto Specialty Co., 128 Second St., Milwaukee.  
Northwestern Chemical Co., Marietta, O. (Carbonox.)  
Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Carbon Remover.)  
Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburgh, Providence, San Francisco, Seattle, St. Louis and St. Paul.

### FIRE EXTINGUISHERS.

Northwestern Chemical Co., Marietta, O. (Fire-Fly.)  
Pyrene Co. of New England, 176 Federal St., Boston.

### FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

### GASKETS.

Brown Co., Inc., Chas. D., 49 Federal St., Boston. (Vel-lumoid.)

### GAUGES.

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Tire Pressure and Gasoline Tank.)  
Branches: In all principal cities.

### GEARS, STEERING.

Ross Gear & Tool Co., 794 Heath St., Lafayette, Ind.

### GUNS, GREASE. (See Oil Pumps.)

### HORNS.

Dean Electric Co., Elyria, O. (Tuto.)  
(Continued on Next Page.)



## THE AUTOMOBILE JOURNAL.

### (BUYERS' GUIDE—Continued.)

**Motor Specialties Co.**, 2 Cooper Lane, Waltham, Mass. (Fogg.)

**Randall-Falchney Co.**, Boston. (Jericho, Jubilee.)  
Branch: 918 Eighth Ave., New York.

#### HOUSES, PORTABLE STEEL.

**Kolb Sales Co.**, 1790 Broadway, New York. (Ruby.)

#### INSULATION.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.

#### LAMP COVERS.

**Hopewell Brothers**, Newton, Mass. (Hopewell.)  
Branch: 1974 Broadway, New York.

#### LICENSE NUMBER BRACKETS.

**National Motor Supply Co.**, 1911 Euclid Ave., Cleveland, O.  
Branches: In all principal cities.

#### LIGHTING SYSTEMS, ELECTRIC.

**Apple Electric Co.**, Dayton, O. (Aplico.)  
**Dean Electric Co.**, Elyria, O. (Dynalux.)  
**Remy Electric Co.**, Anderson, Ind. (Remy.)

#### LOCKS, AUTOMOBILE.

**Bracelet Auto Lock Co.**, 32 No. Clark St., Chicago.

#### LUBRICANTS.

**Borne, Scrymser Co.**, 80 South St., New York. (Colonial.)  
Branches: Boston, Fall River, Philadelphia.

**Dixon Crucible Co.**, Jos., Jersey City, N. J. (Graphite.)  
**Eagle Oil & Supply Co.**, 104 Broad St., Boston. (Eagle-line No-Karbon.)

**Harris Oil Co.**, A. W., 326 South Water St., Providence. (Harris.)

Branch: 143 No. Wabash Ave., Chicago.  
**Maws, Geo. A.**, 142-144 Front St., New York. (Panhard.)

Branch: 899 Boylston St., Boston.  
**Indian Refining Co.**, 17 Battery Place, New York. (Distributors of Havoline Oil.)

Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Building, Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.

**Invader Oil Co.**, 80 Broad St., New York. (Invader.)  
Branches: 284 Columbus Ave., Boston; 113 Arch St., Philadelphia; 3556 11th St., N. W., Washington, D. C.  
**Miller, Chas. E.**, 97-103 Reade St., New York. (Pan-American.)

Branches: See Accessory Manufacturers.  
**New York & New Jersey Lubricant Co.**, 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)

**Northwestern Chemical Co.**, Marietta, O. (Gear-Silence.)

**Standard Oil Co.**, New York. (Polarine.)  
Branches: In all cities.

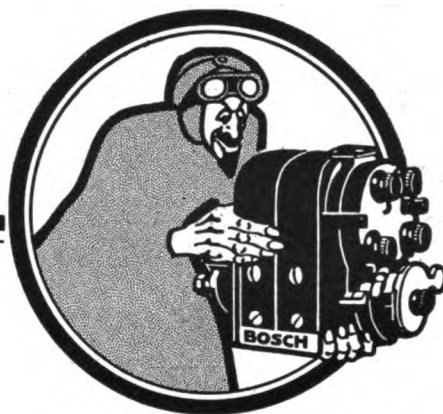
**Texas Company, The**, 7 West St., New York.  
Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.

**Vacuum Oil Co.**, Rochester, N. Y. (Mobiloil.)  
Branches: 49 Federal St., Boston; 29 Broadway, New York; Fourth and Chestnut Sts., Philadelphia; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.; Fisher Bldg., Chicago; Ford Bldg., Detroit; Indiana Pythian Bldg., Indianapolis.  
**Valvoline Oil Co.**, 27 State St., Boston. (Valvoline.)

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Marburg Bros., 1790 Broadway, New York. (Mea.)  
Remy Electric Co., Anderson, Ind. (Remy.)  
Spiltdorf Electrical Co., 98 Warren St., Newark, N. J.  
Branches: 10-20 W. 63rd St., New York; 1110 S. Michigan Ave., Chicago; 180-182 Massachusetts Ave., Boston; 1028 Geary St., San Francisco; 972 Woodward Ave., Detroit; 1228 S. Olive St., Los Angeles, Cal.; S. W. Corner Cherry and Juniper Sts., Philadelphia; 1823 Grand Ave., Kansas City; 1625 Broadway, Seattle, Wash.; London, Eng.; Buenos Aires.

## MASTER VIBRATORS.

New York Coll Co., 338 Pearl St., New York City.

## MEASURES.

Dover Stamping &amp; Manufacturing Co., Cambridge, Mass. (Auto and Savol.)

## MIXING DEVICES, GASOLINE.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

## MOTORCYCLES AND SUPPLIES.

American F. N. Co., Boston. (F. N.)  
Branches: 49 Union St., Providence; 415 Trumbull St., Hartford, Conn.  
Miami Cycle & Manufacturing Co., 320 Hanover St., Middletown, O. (Flying Merkel.)

## MOTOR STARTERS.

Apple Electric Co., Dayton, O. (Aplco.)  
Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.  
Remy Electric Co., Anderson, Ind. (Remy.)

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Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

## PAINT, ANTI-RUST.

Anti-Rust Paint Co., Dept. 7, Akron, O. (Thomas.)  
Northwestern Chemical Co., Marietta, O. (Never-Rust.)

## PATCHES.

Invincible Puncture Proof Tire Co., 53 Sabin St., Providence. (Invincible.)  
National Motor Supply Co., 1911 Euclid Ave., Cleveland.

## POLISH.

International Metal Polish Co., Quill St. and Belt R. R., Indianapolis, Ind. (Blue Ribbon.)  
Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.  
Northwestern Chemical Co., Marietta, O.

## PRIMERS.

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The Automobile Journal, 24 issues, \$1.00 the year.  
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The Accessory and Garage Journal, Monthly, \$1.00 the year.

(Continued on Next Page.)

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## (BUYERS' GUIDE—Continued.)

|   |        |
|---|--------|
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| Sent Postpaid to any address in United States upon receipt of price. Address all communications to The Automobile Journal, Pawtucket, R. I. |        |

## PUMPS, OIL AND GREASE.

Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.  
Randall-Fitchney Co., Boston. (B-Line.)  
Branches: See Horns.

## PUMPS, TIRE.

Brown Co., Syracuse, N. Y. (Brown Impulse.)  
Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.  
Dewey-Anderson Co., Toledo, O. (Dewey Power.)

## RADIATOR CONNECTORS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

## RIMS—REMOVABLE AND DETACHABLE.

Boyd, F. Shirley, 903 Boylston St., Boston. (Dorian.)  
Firestone Tire & Rubber Co., Akron, O.  
Branches: In all principal cities.  
Standard Welding Co., Cleveland. (Stanweld.)  
United States Tire Co., Broadway and 58th St., New York. (Continental and Whittlesey Demountable.)  
Branches: New York, Chicago, San Francisco.

## ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York. (Tarvia.)  
Branches: Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburgh, Cincinnati, Kansas City, Minneapolis, New Orleans, Seattle, London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

## SHIELDS, MOTOR.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (Asbestos.)

## SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Boyd, F. Shirley, 903 Boylston St., Boston.  
J. M. Shock Absorber Co., 210 So. 17th St., Philadelphia. (J. M.)  
Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

## SOAPS.

Hopewell Bros., Newton, Mass. (Paos.)  
Branch: 1974 Broadway, New York.  
Northwestern Chemical Co., Marietta, O. (Dermalene.)

## SPARK PLUGS AND IGNITERS.

Bosch Magneto Co., 223-225 W. 46th St., New York.  
Branches: See Magnetos and Magneto Supplies.  
Heinze Electric Co., Lowell, Mass. (H. E. Co. Priming.)  
(Continued on Next Page.)

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## MULTIBESTOS

The Brake Lining of Quality.

## BRINGS

Sales to the Dealer  
Safety to the Owner  
Service all Around

Adopted after test as regular equipment on Quality Cars. Woven of the purest of asbestos and treated by an exclusive formula. Multibestos has the highest co-efficient of friction and wears most uniformly through the longest life.

Standard Woven Fabric Co., Framingham, Mass.

## SALES BRANCHES:

New York, 276 Canal St. Chicago, 1430 Michigan Blvd.  
Philadelphia, 1427 Vine St. Boston, 903 Boylston St.  
San Francisco, Fred Ward & Son, Inc.

PREVENTS DUST  
PRESERVES ROADS

Booklets on request

## BARRETT MANUFACTURING CO.

New York, Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburgh, Cincinnati, Kansas City, Minneapolis, Corey, Ala.

## INSIST ON GETTING

## Colonial Motor Oil

No substitute "just as good"

## Borne, Scrymser Company

NEW YORK BOSTON FALL RIVER PHILADELPHIA

## GYROSCOPE PRINCIPLE

The New Jones Speedometer Unaffected by Heat or Cold

Any motor car maker will equip with it if you state plainly you want nothing else, no matter what speedometer he may list in his catalog as equipment.

Write us for facts, test and experiments that show Jones supremacy beyond question.

THE JONES SPEEDOMETER—Broadway at 76th Street, NEW YORK

*Elyria-Dean*

Trade Mark

## ELECTRICAL APPARATUS OF QUALITY

Tuto (\$15.00) and Rexo (\$8.00) Auto Horns

THE DEAN ELECTRIC COMPANY

506 Olive St., ELYRIA, O.

DON'T let rim rust destroy your tires;  
Paint them twice a season with

## THOMAS' ANTI RIM RUST PAINT

One dollar a can at your dealers, or write us

The Anti-Rust Paint Co., Dept. 7, Akron, Ohio

STANWELD  
RIMS

Mechanically correct—easy to operate—perfect in material and workmanship. Used as standard equipment on the better cars.

THE STANDARD WELDING COMPANY

Cleveland, Ohio



## (BUYERS' GUIDE—Continued.)

|  |  |   |
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| <b>Dover Soap Economizer</b><br><br>Saves over one-third soap consumption | <b>Dover Electric Light Bulb Case</b><br>Safe and Very Compact<br><br>Send for 1913 Catalogue | <b>DOVER SAVAL MEASURE AND FUNNEL</b><br><br>With Automatic Shut-Off Prevents Overflowing Oil Tank |
|--|--|---|

**DOVER STAMPING & MFG. CO., Cambridge, Mass.**

### Thousands of Car Owners All Over the World Are Using Blue Ribbon Goods



Blue Ribbon Metal Polish  
 Blue Ribbon Nickel Polish  
 Blue Ribbon Auto Body Gloss  
 Blue Ribbon Radiator Leak-proof Cement  
 All BLUE RIBBON products strictly high class and fully guaranteed. BLUE RIBBON moves quick for the dealer—works fast for the consumer.

Ask for sample, giving us name of Dealer or Jobber

**INTERNATIONAL METAL POLISH COMPANY**

Quill and Naomi Streets, Indianapolis, Indiana

W. A. Blackburn, Eastern Distributor, 335 Broadway, Moffat Bldg., New York

## REO THE FIFTH

Final and crowning achievement of R. E. Olds, pioneer designer of autos. A standard size 30 to 35 Horsepower four cylinder car of modern refinements priced at only \$1,095.

(38) R. M. OWEN & CO., General Sales Agents  
 REO MOTOR CAR CO., LANSING, MICH.

## PLANHARD CARBURETOR

When you insist upon having a carburetor that will give increased power and speed, automatic action, perfect control, and will pay for itself in gasoline saved,

It will be a Planhard. Book upon request.

PLANHARD MFG. CO. 1790 Broadway, New York

## PERFECTION SPRING COMPANY



High-Grade  
 Pleasure Car  
 and Motor  
 Truck Springs

CLEVELAND, OHIO

## REMY

STARTS—LIGHTS—IGNITES

Six Volt System Does It All.  
 Write for our magneto exchange offer.

REMY ELECTRIC COMPANY, Anderson, Ind.

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**Johns-Manville Co.,** H. W., Madison Ave. and 41st St. New York City.

**Mosler, A. R., & Co.,** P. O. Box M, Mt. Vernon, N. Y. (Spit Fire.)

**Randall-Falchney Co.,** Boston. (MacKae.)  
 Branches: See Horns.

**Spiltdorf Electrical Co.,** 98 Warren St., Newark, N. J.  
 Branches: See Magnetos and Magneto Supplies.

**Standard Co.,** The, Torrington, Conn. (Black Eagle.)

### SPARK PLUG TERMINALS.

**Johns-Manville Co.,** H. W., Madison Ave. and 41st St. New York City.

**Randall-Falchney Co.,** Boston. (Mac-Kae Blitz.)  
 Branches: See Horns.

### SPEEDERS.

**Interstate Auto Accessory Co.,** Indianapolis. (Ideal.)

### SPEEDOMETERS, RECORDERS, ETC.

**Hoffecker Co.,** The, Motor Mart, Boston. (Hoffecker.)

**Jones Speedometer,** New Rochelle, N. Y.

Branches: Broadway and 76th St., New York; 109 Massachusetts Ave., Boston; 1416 Vine St., Philadelphia; 1430 Michigan Ave., Chicago; 852 Main St., Buffalo; 253-255 Jefferson Ave., Detroit; 530 Golden Gate Ave., San Francisco; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

**Northwestern Chemical Co.,** Marietta, O. (Hydrometers and Thermometers.)

**Service Recorder Co.,** 2245 East 105th St., Cleveland (Servis.)

**Stewart-Warner Speedometer Corp.,** Chicago. (Auto-Meter.)

Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330 1/2 North Illinois St., Indianapolis; 1613 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia; 5940 Kirkwood Ave., Pittsburg; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

### SPRINGS FOR AUTOMOBILE SUSPENSION.

**Marburg Bros., Inc.,** 1790 Broadway, New York. (Marburg-Hagen.)

**Perfection Spring Co.,** No. 1 Plant, 2414 Superior Ave., N. W.; No. 2 Plant, East 65th and Central Ave., Cleveland.

### SPROCKETS.

**Boyd, F. Shirley,** 903 Boylston St., Boston. (Baldwin.)

### STEEL PARTS, SEAMLESS.

**Standard Welding Co.,** Cleveland.

### STORAGE SYSTEMS—GASOLINE AND OIL.

**Seafie & Sons Co.,** Wm. B., Pittsburg, Penn.  
 Branch: New York City.

### TANKS, ACETYLENE GAS.

**Prest-O-Lite Company,** 271 East South St., Indianapolis. (Prest-O-Lite.)

Branches: See Cylinder Cleaning Compound.  
 (Continued on Next Page.)



(BUYERS' GUIDE—Continued.)

**TANKS FOR FUEL AND WATER.**

**Sealife & Sons, Wm. B.,** Pittsburg, Penn.  
Branch: New York City.

**TANKS, TIRE INFLATING.**

**Prest-O-Lite Co.,** 271 East South St., Indianapolis.  
(Baby Tire Filler, The Emancipator.)  
Branches: See Cylinder Cleaning Compound.

**TAPE—ASBESTOS.**

**Johas-Manville Co., H. W.,** Madison Ave. and 41st St.,  
New York City.

**THERMOS CASES.**

**Dover Stamping & Mfg. Co.,** Cambridge, Mass.

**TIRE ACCESSORIES.**

**Cox Brass Mfg. Co.,** Dudley Ave., Albany, N. Y. (Holders.)  
**Firestone Tire & Rubber Co.,** Akron, O.  
Branches: See Rims—Removable and Detachable.

**TIRE CASES.**

**Hopewell Brothers,** Newton, Mass. (Hopewell.)  
Branch: 1974 Broadway, New York.

**TIRE CHAIN GRIPS. (See Chains.)**

**TIRE PRESERVATIVES AND PROTECTORS.**

**Northwestern Chemical Co.,** Marietta, O. (Tire-Lac.)

**TIRES—CASINGS AND INNER TUBES.**

**Braender Rubber & Tire Co.,** Rutherford, N. J. (Braender.)  
**Catacract Rubber Co.,** Wooster, O. (Catacract.)  
Branches: Boston, New York, Providence.  
**Dayton Rubber Mfg. Co.,** Dayton, O. (Dayton Airless.)  
**Firestone Tire & Rubber Co.,** Akron, O. (Firestone.)  
Branches: See Rims—Removable and Detachable.  
**Gaulois Tire Co.,** 1926 Broadway, New York. (Gaulois.)  
**Goodyear Tire & Rubber Co.,** Madison St., Akron, O. (No-Rim-Cut.)  
Branches: In all principal cities.  
**United States Tire Co.,** Broadway and 58th St., New York. (Continental, G & J, Hartford, Morgan & Wright.)  
Branches: See Rims—Removable and Detachable.

**TIRES—CUSHION.**

**Catacract Rubber Co.,** Wooster, O. (Catacract.)  
Branches: Boston, New York, Providence.  
**Firestone Tire & Rubber Co.,** Akron, O. (Firestone.)  
Branches: See Rims—Removable and Detachable.  
**Mots Tire & Rubber Co.,** The, Akron, O. (Electric Special Motz Cushion.)  
Branches: Boston, New York, Philadelphia, Pittsburg, Chicago, Kansas City, Detroit, Cleveland, Los Angeles.

**TIRES—SOLID AND COMMERCIAL.**

**Firestone Tire & Rubber Co.,** Akron, O.  
Branches: See Rims—Removable and Detachable.  
**Goodrich Co., B. F.,** Akron, O. (Goodrich.)  
**Mots Tire & Rubber Co.,** The, Akron, O. (Mots.)  
Branches: See Tires—Cushion.  
**Polack Tyre and Rubber Co.,** 246 W. 59th St., New York City. (Polack.)

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# HERZ PLUG

Eventually you will disregard the cheap hardware commonly called "Spark Plugs," and use the HERZ PLUG—the only Plug that is or can be

**Guaranteed  
a Year**

The usual Spark Plug troubles are unknown to users of the HERZ PLUG. Once installed, it never is taken out.

Double Blue Enamel Stone

No Sooting—No Cleaning—No Forcelain—No Breakage.

**No Experiment:  
In its 20th Year**

Price \$1.50 postpaid. Ask your dealer, or write us.

We also make the  
**HERZ MAGNETO**

**HERZ & CO.**  
295 Lafayette St. New York.

**Type 35  
Series J  
Raceabout  
Guaranteed  
Speed—Mile in  
51 Seconds**



## MERCER

The car which most perfectly meets the medium weight demand. Dealers should carefully consider this fact.

*Write today regarding unallotted Territory.*

**MERCER AUTOMOBILE CO.,** 1100 Whiteland Road  
TRENTON, N. J.

## BRAENDER TIRES & TUBES

Are of the highest quality and the cheapest on mileage. They are built to last. Send for price list and particulars.

**BRAENDER RUBBER & TIRE CO.**  
Main Office and Factory RUTHERFORD, N. J.

## VALVOLINE OIL CO.

Heavy, Medium and Light  
**Automobile Oils**  
**27 STATE STREET, BOSTON, MASS.**



# HECO-Magnetos

INSURE  
A STEADY SPARK  
AT ANY R.P.M.



HECO MAGNETOS are the product of experts specialized in the electrical business. They embody all that the electrical industry knows about magnetos.

By our special method of winding the secondaries we are able to positively guarantee them against burning out or breaking down.

HECO MAGNETOS supply a spark of equal intensity for any number of revolutions per minute.

We also make the well-known HECO COILS, and HECO COMBINATION PRIMERS and SPARK PLUGS. Let us send you our complete catalog.

**HEINZE ELECTRIC COMPANY**  
Factories and Gen'l Office, Lowell, Mass.  
Sales Office, Detroit, Mich.

## Hoffecker

"The Steady Hand"

## Speedometer



Accurate, durable—the one speedometer with a daily trip register that can be set at any mileage at any time.

**THE HOFFECKER COMPANY**  
Motor Mart—Main Offices—Boston, Mass. PRICES \$25 to \$135  
BRANCH OFFICES  
1779 Broadway . . . New York 1217 Huron Road . . . Cleveland  
Sheridan & Palma, Pittsburgh Cor. Broad & Race Sts., Philadelphia

**F. SHIRLEY BOYD**  
903 Boylston St. Boston, Mass.  
Dorian Demountable Rims.  
Supplementary Spiral Springs. R. I. V. Ball Bearings.

**CAMERON CARS \$975**  
All Up-To-Date Features  
Four cylinder, water cooled, 30 H. P. Four forward speeds. 112 in. wheelbase. Left hand drive, centre control. Starts from seat. Pointed hood, beautiful lines and finish. Equipment unsurpassed at the price.  
Write for full details and terms to agents  
**THE CAMERON MANUFACTURING CO.** Beverly, Mass.

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### (BUYERS' GUIDE—Concluded.)

**United States Tire Co.,** Broadway and 58th St., New York.  
Branches: See Rims—Removable and Detachable.

#### TOPS AND ATTACHMENTS.

**Springfield Metal Body Co.,** 20 Medford Ave., Springfield, Mass.

#### TROUBLE FINDERS.

**Hopewell Brothers,** Newton, Mass. (Vibrator).  
Branch: 1974 Broadway, New York.

**TRUCKS AND TRACTORS**—(See Cars, Commercial.)

#### TRUNK RACKS.

**Connecticut Steel & Wire Co.,** Hartford, Conn.

#### TUBING, GAS.

**Johns-Manville Co.,** H. W., Madison Ave. and 41st St. New York City.

#### TURNABLES.

**Beach Co., T. C.,** 108 Ottawa St., St. Johns, Mich. (Beach.)

#### UNIVERSAL JOINTS.

**Bretz Co., J. S.,** 520 W. 54th St., New York. (Hartford.)

#### VALVE GRINDERS.

**Wall, J. H.,** 290 Hope St., Bristol, R. I. (Ford.)

#### VALVE LIFTERS.

**Winsor Manufacturing Co.,** Providence, R. I.

**VOLTMETERS**—(See Ammeters.)

#### VULCANIZERS.

**National Motor Supply Co.,** 1911 Euclid Ave., Cleveland. (Garage and Individual.)

Branches: In all principal cities.

**Vanderpool Co.,** Springfield, O.

**Williams Foundry & Machine Co.,** Akron, O.

#### WELDING, AUTOGENOUS.

**Autogenous Welding Equipment Co.,** Springfield, Mass.

#### WELDING OUTFITS.

**Prest-O-Lite Co.,** 309 W. South St., Indianapolis. (Prest-O-Welder.)

Branches: See Cylinder Cleaning Compound.

#### WELDING STEEL.

**Standard Welding Co.,** Cleveland.

#### WHEELS.

**McCue Co., The,** Buffalo, N. Y. (Wire.)

#### WIRE MECHANISM.

**Bretz Co., J. S.,** 250 W. 54th St., New York. (Bowden.)

#### WRENCHES AND COMBINATION OUTFITS.

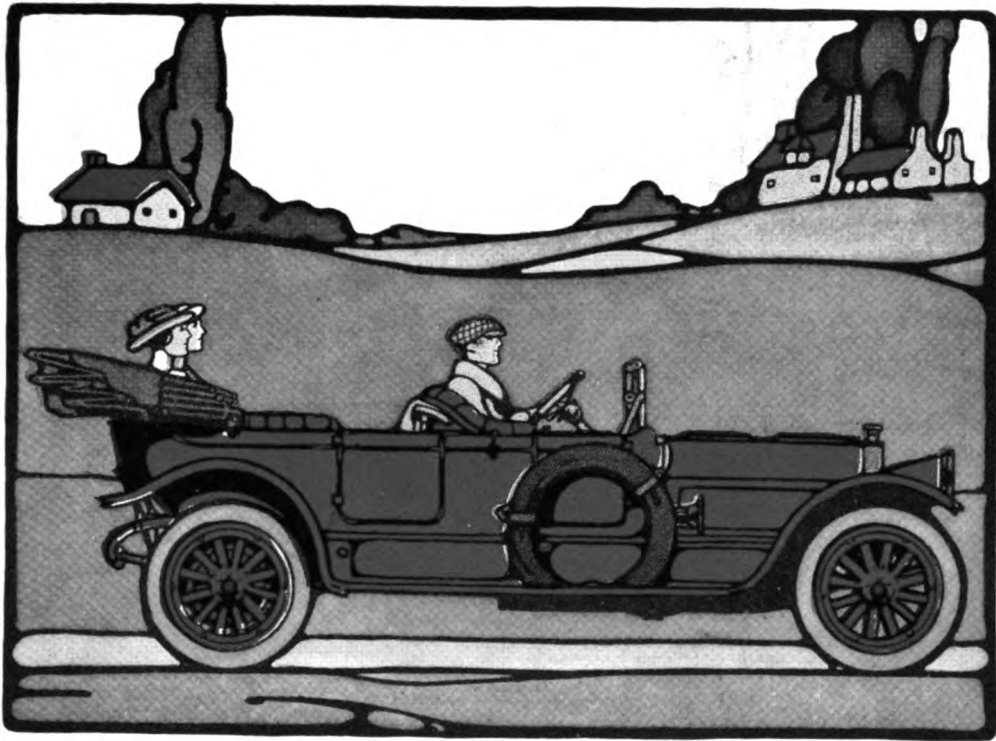
**Allen Wrench and Tool Co.,** Providence, R. I. (Allen Friction Socket Sets.)

**Coes Wrench Co.,** Worcester, Mass.

**Cutter, George A.,** Taunton, Mass.

**Walworth Manufacturing Co.,** Boston. (Stillson.)





**NO** matter what you pay for an Automobile, unless you buy with it a service that lasts as long as the car lasts, you have not made a good investment. In each city where

## **THE PIERCE- ARROW CARS**

are sold there is a complete establishment for rendering those cars every attention they may need.

**The Pierce-Arrow Motor Car Co., Buffalo, New York**





Quality  
and  
Quantity

Nearly 700 cars of the  
best Foreign & American  
makes are stored in the  
A.C.A. Garage

Nearly all of these no-  
table cars, owned by prom-  
inent New Yorkers, are e-  
quipped with ~

**F & S** Ball Bearings  
**BRETZ**  
COMPANY  
Sole  
Importers

250 West Fifty-fourth, New York

MEMBERS ENTRANCE OF THE  
AUTOMOBILE CLUB OF AMERICA,  
WEST 54 TH. ST. - NEW YORK.



# AUTOMOBILE JOURNAL

\$1.00 the year  
10 cents the copy

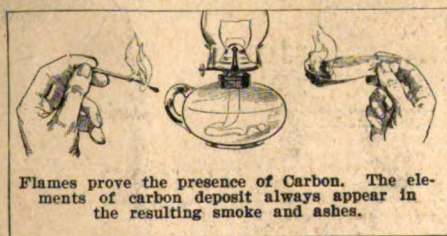
PAWTUCKET R.I.

October 10, 1913

## CARBON DEPOSIT—How to reduce it

Considerable nonsense is current about carbon deposit.

Any product that will burn must be largely carbonaceous.



Lubricating oil will burn and is therefore plainly carbonaceous. Non-carbon oils cannot exist.

But the amount of carbon deposited depends on the carburetion and gasoline combustion, and on the character of the gasoline, as well as on the lubricating oil itself and its fitness for the car.

The presence or absence of carbon deposit in no way determines the lubricating efficiency of the oil.

Under identical conditions, however, some lubricating oils will give much more carbon deposit than others. This is due, in part, to three conditions:

- (1) The crude oil from which the lubricant was manufactured may have been unsuited to gas engine purposes.
- (2) The oil may have been improperly manufactured or filtered.
- (3) Its "body" may permit it to work too freely past the piston rings into the combustion chambers.

To reduce carbon deposit, it is absolutely neces-

sary to use an oil whose "body" is suited to your piston clearance.


In our chart of recommendations we specify oil of a "body" suited to the piston clearance and other lubricating conditions in each motor.

The oils themselves are scientifically manufactured from the crude bases best suited to motor car lubrication.

They are thoroughly filtered to remove free carbon and other impurities.

If you are particular about your fuel, and your carburetion and ignition, the grade of Gargoyle Mobiloil specified for your car will put an end to unnecessary carbon troubles.

A booklet, containing our complete lubricating chart and points on lubrication, will be mailed on request.

**GARGOYLE**  
  
**Mobiloil**  
A grade for each type of motor.

The various grades, refined and filtered to remove free carbon, are: Gargoyle Mobiloil "A," Gargoyle Mobiloil "B," Gargoyle Mobiloil "D," Gargoyle Mobiloil "E," Gargoyle Mobiloil "Arctic."

They are put up in 1 and 5 gallon *sealed cans*, in half-barrels and barrels. *All are branded with the Gargoyle, which is our mark of manufacture.* They can be secured from all reliable garages, automobile supply stores, and others who supply lubricants.

VACUUM OIL COMPANY, Rochester, U. S. A.

### BRANCHES:

DETROIT  
Ford Bldg.

BOSTON  
49 Federal St.

NEW YORK  
29 Broadway

CHICAGO  
Fisher Bldg.

PHILADELPHIA  
4th & Chestnut Sts.

INDIANAPOLIS  
Indiana Pythian Bldg.

MINNEAPOLIS  
Plymouth Building

Distributing warehouses in the principal cities of the world.



# The Largest Automobile Supply House in America

## The Miller Automobile Jack

The MILLER AUTOMOBILE JACK is a single acting, automatic-lowering jack, designed especially for automobile use and is adapted to the factory or garage as well as to be carried as a part of the equipment on motor cars. The MILLER JACK is constructed of the best material, no complicated or loose fitting parts to get out of order, and in material, workmanship and finish, the MILLER JACK is not exceeded, if indeed, it is equalled by any other jack. It is a high grade and one of the finest finished jacks on the market.

The short stroke makes lifting easy and rapid. Automatically locks while operating, thereby doing away with any possibility of slipping or dropping the load.

Fitted with a simple and convenient trip lever for reversing. Height, 11 inches. Raises 6 inches. Weight, 9 lbs. Capacity, 1 ton.

We guarantee this jack for 12 months, and at the price, it is the best value ever offered to the automobile trade.

We are in a position to quote a special price to manufacturers, jobbers and dealers who buy in quantities.

### CAPACITY: ONE TON.

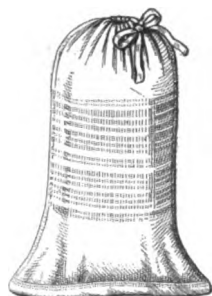
The List Price of the MILLER JACK,  
guaranteed for twelve months.....\$3.00 each

Weight, packed for Parcel Post, 10 lbs.

**AGENTS WANTED. ADDRESS JACK DEPARTMENT.**



THE MILLER JACK  
Designed for any  
size and style of au-  
tomobile and is  
adapted for all pur-  
poses.



TUBE BAG

## 25c A REAL INNER TUBE BAG FOR 25c

MAILED TO ANYONE IN ANY PART OF THE UNITED STATES  
MADE OF HEAVY NAPPED CLOTH

Will keep your inner tube free from grit and dirt, and from scratching or chafing while in the tool box or luggage carrier. Answers the same purpose as tube bags which cost \$1.50 or more. Will hold one tube 5 inches or smaller. Protect your tubes and reduce your tire expense. In ordering, state size of tube.

Send 25c, in stamps or coin, and tube bag will be sent to you by return mail

Send your name and address NOW with 4 cents postage (to cover cost of mailing) for a free copy of our Big 256 Page Catalog

# Chas. E. Miller

Manufacturer, Jobber, Exporter, and Importer  
97-99-101-103 Reade St., New York City

Established 1896

### ORDER FROM NEAREST BRANCH, ADDRESS CHAS. E. MILLER

NEW YORK CITY  
97-103 Reade St.  
NEW YORK CITY  
924 Eighth Avenue  
NEW YORK CITY  
2782 Broadway  
BROOKLYN, N. Y.  
1421 Bedford Avenue

BUFFALO, N. Y.  
824 Main Street  
ALBANY, N. Y.  
135 Central Avenue  
BOSTON, MASS.  
202-204 Columbus Ave.  
SPRINGFIELD, MASS.  
Bridge & Dwight Sts.

HARTFORD, CONN.  
274 Trumbull St.  
DETROIT, MICH.  
227-229 Jefferson Ave.  
CLEVELAND, O.  
1829 Euclid Avenue  
PHILADELPHIA, PA.  
318 North Broad St.

ATLANTA, GA.  
259 Peachtree Street  
NEW ORLEANS, LA.  
601-603 Baronne St.  
NEWARK, N. J.  
274 Halsey Street





# CURE YOUR CORNS

on your hands caused  
by shifting gears.

You can simply push  
a button and secure any  
speed you desire by  
using the

## Automatic Electric Gear Shifter

AND



## STORAGE BATTERY

You are already familiar with electric lighting and Self Cranking Systems. The same generator charges the LBA Battery for three purposes:

**SELF CRANKING  
GEAR SHIFTING  
ELECTRIC LIGHTING**

*Write us for full information*

**Willard Storage Battery Co.  
CLEVELAND, OHIO**

New York Branch—136 West 52d Street

San Francisco Branch—243 Monadnock Building

Indianapolis Branch—438 & 439 Indiana Pythian Bldg.

Detroit Branch—1191 Woodward Avenue

Chicago Branch—2241 Michigan Avenue

*Depots in all Principal Cities in the United States, Canada and Mexico*

(69)

When Writing to Advertisers, Please Mention The Automobile Journal.





The tendency toward all-metal construction has become an irresistible movement in all lines of building. Steel is used for the framework of buildings, bridges, etc. It provides protection against fire and elements and makes open, web-like construction possible, at the same time supplying the means of securing flexibility required by any structural work which carries a tremendous load.

In almost every means of transportation, railway coaches, steamships, automobiles, etc., where high speed is required steel construction demonstrates its superiority over wood. While the more compact construction made possible by the use of steel is desirable, its greatest benefit is the factor of safety that accrues.

Wire wheels are the last and most important wood replacement in automobile development, the last step in making the motor car what it should be, a creature of steel throughout.

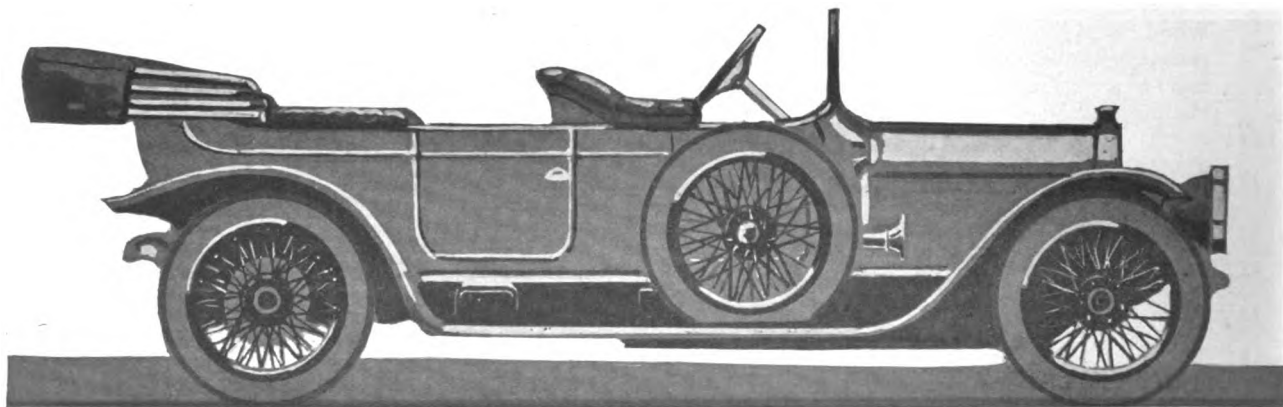
McCue Wire Wheels are built along the most modern conception of wire wheel construction. Standard S spokes, made by the Standard Company of Torrington, Conn., are used. With McCue Wire Wheels the weight of the car is suspended equally from all points on the rim and the rim itself, impervious to weather, is light, thus relieving the tire of the extra pound, pound, pound which the heavy wooden rim subjects it to. Steel rims also conduct the molecular and frictional heat away from tires and prolong their life more than fifty per cent.

McCue Wire Wheels provide a factor of safety in proportion to their strength—seven times that of wooden wheels in their capacity to support loads, and fifteen times the strength of wooden wheels to resist side thrust such as comes from skidding, etc.

Write us for booklet describing the development of wire wheels, causes which brought about their use, and their superiority when compared with the ordinary artillery type wheel.

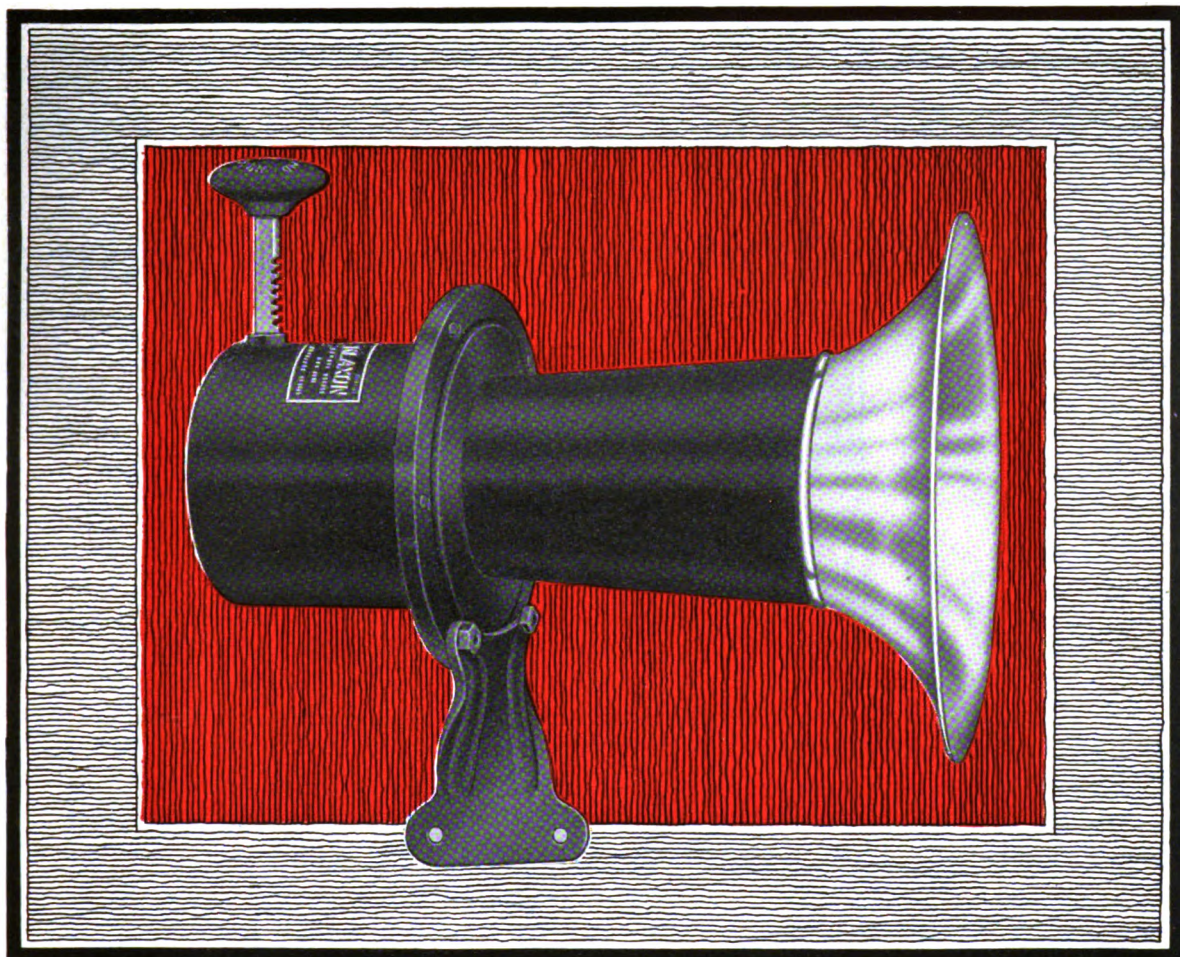
## THE McCUE COMPANY

### Buffalo, New York



When Writing to Advertisers, Please Mention The Automobile Journal.





## The Hand Klaxon, \$10

**THE HAND KLAXON** is not entirely new. It is a development of the original Hand Klaxon manufactured in 1909 and since then gradually discontinued owing to the large demand for motor driven Klaxons.

The Hand Klaxon operates on the Klaxon principle of a steel diaphragm set in violent vibration by a toothed wheel. In the electric Klaxon this wheel is rotated by means of an electric motor; in the Hand Klaxon by a train of gears that attain high speed under pressure on the push-rod.

The Hand Klaxon has the true Klaxon note and is sold under the regular Klaxon Guarantee of permanent satisfaction.

Klaxon quality is built into the Hand Klaxon. With the Klaxon reputation to sustain it is obvious that we cannot afford to put the Hand Klaxon on the market unless it is vastly superior to any other mechanical signal at present in use.

The price of the Hand Klaxon is \$10. Orders accepted November 1st; deliveries will begin December 1st.

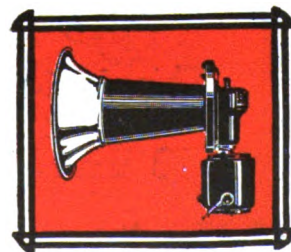


**KLAXONET**

Lovell-McConnell Mfg Company Newark, N.J., U.S.A.

# KLAXON

*"The Public Safety Signal"*



**KLAXON**

This advertisement planned, written and set up entirely in the Klaxon Factory Type composition by the Klaxon Press with "Klaxon" type especially designed by Goudy

**When Writing to Advertisers, Please Mention The Automobile Journal.**





# Greater than the Self-Starter!

## The Vulcan Electric Gear Shift

on the

# HAYNES

*America's First Car*

**Grab it!** Don't make the mistake of waiting until you've seen whether it makes good. It's bound to make good. It's mechanically a success. We proved that before we adopted it. It fills a bigger need than the starter. It's an improvement that has already created more interest and comment than the self-starter or any other great feature of the past.

**Dealers who sold the first self-starter cars saved hundreds of dollars in salesmanship and made a clean-up**

The self-starter put the fortunate cars which were first to use it in a class by themselves. People were wild to see the cars with the new device. They sought out the salesrooms of the local dealers and practically dropped their orders into the dealers' laps.

**Where are the dealers who said the self-starter wouldn't make good?**

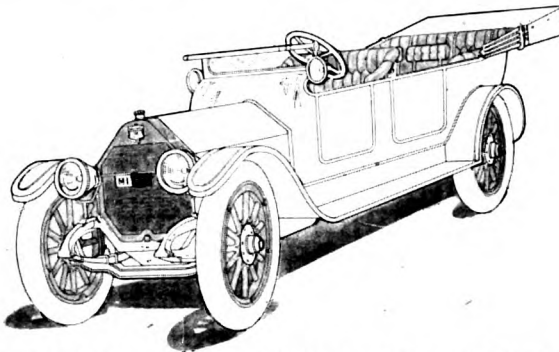
When the news spread through the automobile trade, not so many months ago, that a device had been invented to start automobile engines, some dealers got busy and arranged for big orders of the improved cars. Others said: "The device may not work. We'll wait and see." They missed the great benefits which accrued to the dealers who had the sale of cars equipped with self-starters.

**This is to be an Electric Gear Shift year, like last year was an electric-starter year**  
**What are you going to do about it?**



When Writing to Advertisers, Please Mention The Automobile Journal.





Model 27—136-in. wheelbase, 6 cylinder, 7 passenger body. Price, \$2785

# HAYNES

*America's First Car*

with the Vulcan Electric Gear Shift is the season's big selling hit

The Haynes has always been a distinctive car—a car of great prestige and reputation—continually a leader in the adoption of fundamental improvements and betterment features. It has always been a strong car for the dealer who was awake to the selling opportunities at his command.

**The Electric Gear Shift gives Haynes dealers a great chance**

All that was true of the self-starter as a selling influence will be true in double measure of the Electric Gear Shift. This feature added to a strong selling proposition in every other way—as you'll see from the table of specifications—puts the Haynes dealer in an enviable position. There may yet be the opportunity for a Haynes dealer in your town.

***The strongest line-up of features ever embodied in a motor car***

**Motor**—Bore 4 1-4 in., Stroke 5 1-2 in. L-head Haynes. Cylinders cast in pairs. Model 26, A.L.A.M., 43.35 H. P., Dynamometer 65 H. P., Model 27, A.L.A.M., 43.35 H. P., Dynamometer 65 H. P., Model 28, A.L.A.M., 29.9 H. P., Dynamometer 48 H. P.

**Weight**—Model 26, 3800 lbs., Model 27, 4000 lbs., Model 28, 3400 lbs.

**Cooling**—Centrifugal pump and pressed steel fan.

**Wheel Base**—Model 26, 130. Model 27, 136. Model 28, 118.

**Ignition**—American Simms Magneto.

**Carburetor**—Stromberg.

**Lubrication**—Splash and gravity feed.

**Control**—Left hand. Vulcan Electric Gear Shift.

**Transmission**—Selective Type, three speeds forward, one reverse.

**Steering Column**—Worm and worm gear type.

**Clutch**—Haynes contracting steel band.

**Rear Axle**—Full Floating Timken on Models 26 and 27; McCue, Model 28, Gurney Bearings.

**Front Axle**—I-Beam. O. H. steel heat treated.

**Wheels**—Artillery type. Funk demountable rims.

**Tires**—Models 26 and 27, 36x4 1-2. Model 28, 34x4.

**Springs**—Front Semi-elliptic 39 1/2 x 2, rear 48 x 2.

**Brakes**—15 1-4 external and 15 internal Models 26 and 27. 12 and 16 internal on Model 28.

**Body**—Indiana blue or Pacific tour gray; chassis black, fenders black enamel.

**Gasoline Feed**—Pressure, Automatic feed.

**Upholstery**—Buffed leather. Deep cushions.

**Starting and Lighting**—Leece-Neville electrical system.

**Cowl-board Equipment**—Electric lights, sight oil feed, automatic cut-out for generator, dash light, auxiliary air pressure pump, air gauge and speedometer. Models 26 and 27 have rim wind clock.

**Other Standard Equipment**—Top, top cover, mechanical tire pump, rain vision, ventilating wind-shield, Vulcan electric gear shift, two large electric headlights, electric side lights, electric tail light, electric starter, generator, 12 volt, 60 ampere hour storage battery, horn, coat and foot rails, tire irons, full tool equipment, one extra demountable rim and Collins curtains. Models 26 and 27 have shock absorbers.

Hand lever shift optional, all models, at \$200 reduction.

## The Haynes Automobile Company

6 Main Street, KOKOMO, IND.

When Writing to Advertisers, Please Mention The Automobile Journal.

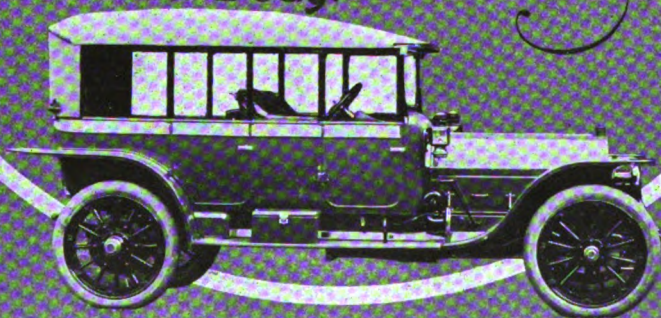


# SPRINGFIELD METAL BODY CO



Springfield Convertible Bodies  
A Construction Giving the  
Qualities of a Limousine & Tour-  
ing Equipment That May Be Con-  
verted as Quickly as a Folding Top  
Can be Raised or Lowered. When  
folded the Full Space of the Touring  
Car is Available — When Raised it  
is a Regular Top or it Can Be Glass  
Enclosed.

Dealers, Who Insist on Quality  
Equipment, Specify The Springfield  
Convertible Body.



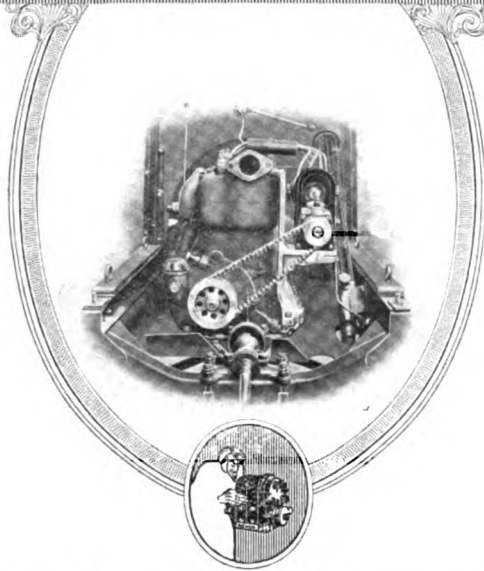
# SPRINGFIELD, MASSACHUSETTS

When Writing to Advertisers, Please Mention The Automobile Journal.



**BOSCH-FORD ATTACHMENT**

A  
Bosch Magneto  
For Ignition



The  
Ford Generator  
For Lighting

## Gives Ford Cars Maximum Efficiency

THE Bosch-Ford System has been designed to meet an urgent appeal for a more efficient and reliable ignition system, one that would eliminate preignition, overheating and the inherent difficulties and harmful effects of unsynchronized ignition.

The Bosch-Ford Attachment employs the Bosch Magneto and permits of this well-known system being easily adapted. The average motorist can install it and requires only the tools in the average tool-kit to do so.

Every Ford owner and all those engaged in the sale and repair of motor cars should investigate this proposition without delay.

**Illustrated literature sent on your request**

# Bosch Magneto Company

204 West 46th Street

New York

Maine Motor Car Co., Portland, Me.—Motor Parts Co., Boston—N. E. Distributors.

**When Writing to Advertisers, Please Mention The Automobile Journal.**



# Overland

## 1914

### \$950

*With Gray & Davis electric starter and generator—\$1075*  
*Prices f. o. b. Toledo*

*A larger, more powerful  
 and more finely finished  
 car in every respect.*

*But the price is lower  
 than ever.*

*1914 catalogue on request.*

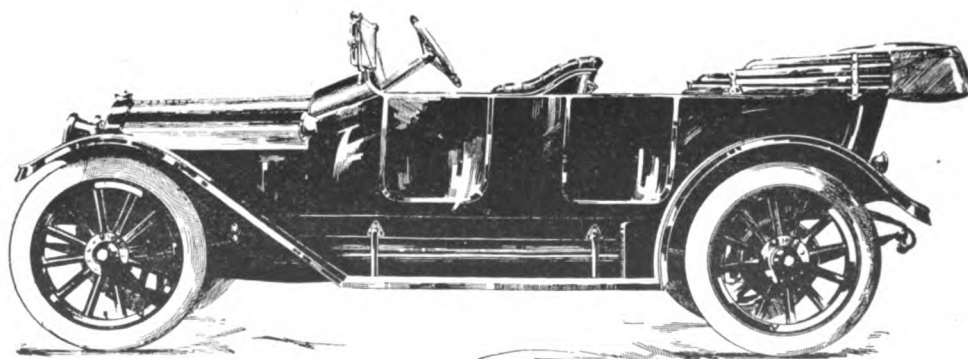
*Please address Dept. 52*

Full electric lights  
 Storage battery  
 35 horsepower motor  
 114-inch wheelbase  
 Timken bearings

33 x 4 Q. D. tires  
 Clear vision windshield  
 Brewster green body  
 with light green striping,  
 nickel and aluminum trimmings

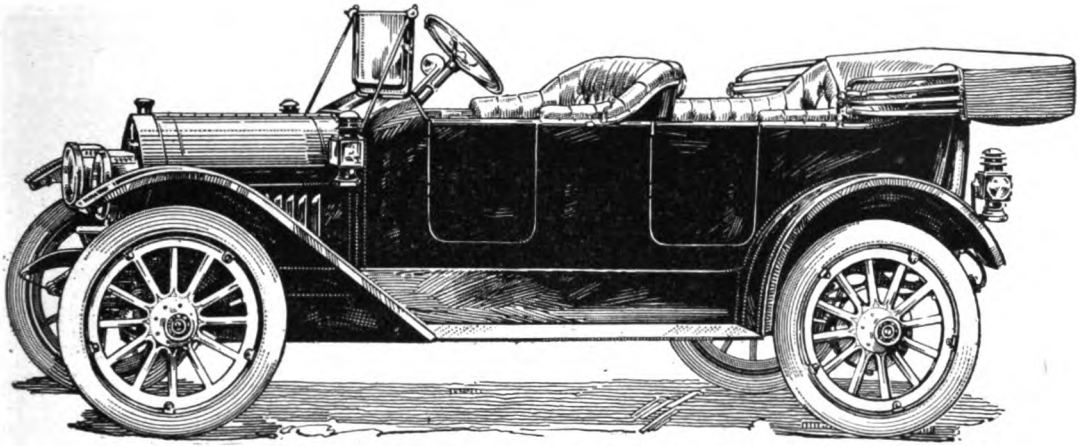
Mohair top and boot  
 Stewart  
 speedometer  
 Electric horn

**The Willys-Overland Company, Toledo, Ohio**



**When Writing to Advertisers, Please Mention The Automobile Journal.**





# EMPIRE

*"The Little Aristocrat"*

Completely Equipped

## Now \$900

New Series Model 31 Empire, for the Season of 1914

*A larger, more beautiful car with every luxury and equipment*

Basic principles of design and construction unchanged; severest tests and hundreds of thousands of miles prove them right. *But a score of refinements and improvements* are incorporated in the new series Model "31" EMPIRE for 1914 that make it still a better car than last season's EMPIRE, and it sells for less.

*Quadrupled output and quantity buying enables us to add to the beauty, size and value of the car and yet to reduce the price by fifty dollars—the biggest value yet offered to dealers and automobile buyers.*

Dealers, there remains some open territory. Our broad, liberal sales plan offers a rare opportunity for a permanent connection. Tomorrow may be too late to secure territory.

**Completely Equipped \$900 Including**

Demountable Rims  
Mohair Top  
Top Envelope  
110" Wheel Base

Unit Power Plant  
Rain Vision Windshield  
Tool and Tire Kits  
Extra Rim

Stewart Speedometer  
Prest-O-Lite Tank  
Gas Headlights  
Oil Side and Tail Lamps

Eisemann Magneto  
Double Tire Irons  
Oil Sight Feed  
Dash Air Adjustment

Write for Our Advance Catalogue for 1914 and for a Copy of Our Illustrated Transcontinental Empire Tour Book

# EMPIRE AUTOMOBILE COMPANY

448-50 N. Capitol Ave., Indianapolis, Ind., U. S. A.





## Our Exclusive Feature

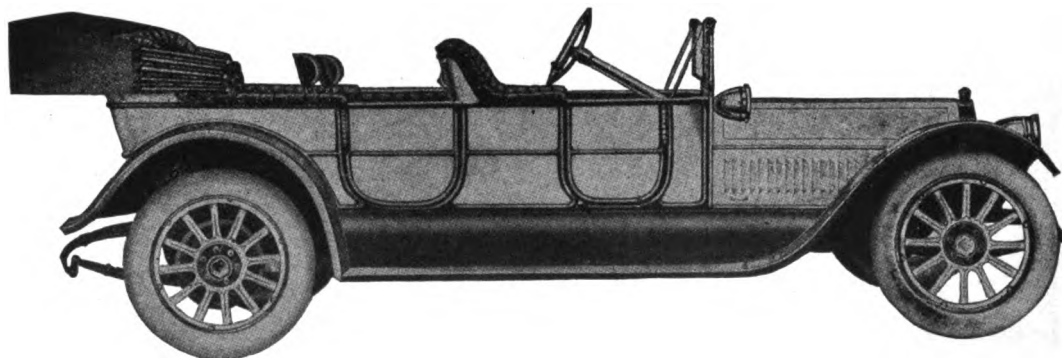
We will (at small extra cost) furnish  
our Regular Models with the



# AUSTIN

## Two-Speed Axle

This axle provides two different gear ratios, both on direct drive, and in combination with a three-speed transmission gives six speeds forward and two reverse.



Model "77" has a Regular Direct Drive of 3 1-2 to 1, and a Special Direct Drive of 2 to 1.  
Model "55" has a Regular Direct Drive of 4 1-2 to 1, and a Special Direct Drive of 3 to 1.

The Regular Direct Drive provides ample power and exceptional ease of control for hills, bad roads and crowded city traffic.

The Special Direct Drive for normal conditions, shows a gain of over 50% in mileage for the same fuel consumption and motor speed, eliminates the noise, wear and tear of running the motor at excessive speeds, adds materially to the life and durability of the car and pleasure of riding.

|   |   |   |           |
|---|---|---|-----------|
| Model "77" Six Cylinders, 4 1-2 x 7     | - | - | \$6000.00 |
| Model "66" Six Cylinders, 4 1-2 x 5 1 2 | - | - | \$5000.00 |
| Model "55" Six Cylinders, 4 x 5         | - | - | \$4000.00 |

**MORE NEW, IMPROVED and DISTINCTIVE FEATURES** than any other car.  
Two-speed rear axle, high pressure air self-starting system, complete electric lighting system, left hand steer, center control, two-spark magneto, four-speed transmission, both brakes controlled by foot pedals.

*Write for complete description and any information you may desire in regard to our two-speed axle.*

# Austin Automobile Company

GRAND RAPIDS, MICHIGAN





# STOP

!!!!!!

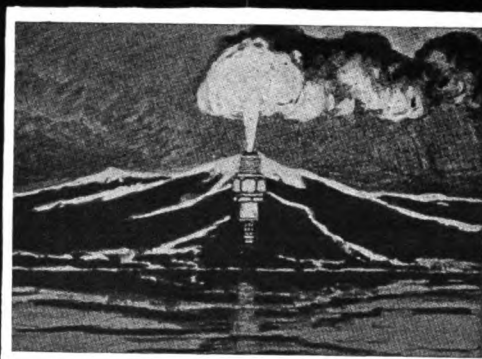
Imagine  
a  
plug  
that  
will  
last  
forever



# WATCH

!!!!!!

Mosler  
**Vesuvius**  
Plug

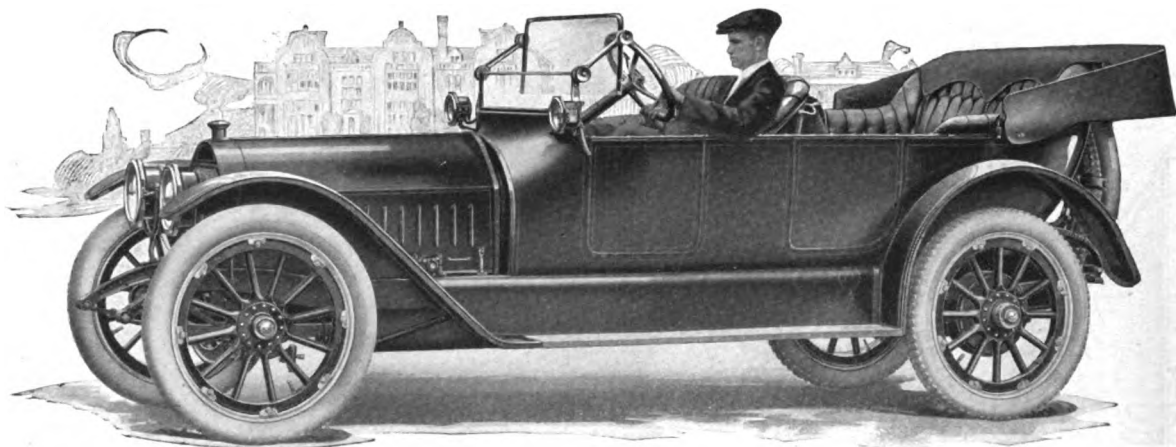


AS POWERFUL AND AS  
INDESTRUCTIBLE AS THE  
FIRES OF VESUVIUS

WE CARRY IN STOCK  
A PLUG FOR EVERY  
Internal Combustion Engine Built

**A. R. MOSLER & CO.**  
P.O. Box "M," MT. VERNON, N. Y.





## A "Six" that is different

The new KisselKar 48-"Six" was designed to serve a definite purpose, to fill a distinct and different niche. It is in a class all its own. Neither a "big six" or a "little six," it fills in the gap between, making the ideal compromise for the man who considers a "big six" too big and the average sized "six" inadequate.

# 48 "Six" KISSELKAR 48 "Six"

The KisselKar 48-"Six" is one of the very few really upper-class cars selling at a moderate price. It is growing steadily in favor of those who know automobile values and buy only after careful comparison.

The lines of the KisselKar 48-"Six" are unsurpassed in beauty. The low hung body, running boards free from boxes or brackets, 21-inch doors and new, rounding top fenders will impress you with the artistic symmetry of the design. The KisselKar motor is remarkable for simplicity, power, silence and ease of control.

The KisselKar 48-"Six" riding comfort is unique. It is due to the liberal wheelbase—big wheels—big tires—springs specially constructed according to weight—unusually roomy ton-

neau—deep seat upholstery—the perfect "balance" of the car, and almost entire absence of engine vibration.

There are three KisselKar Models: 48-"Six," \$2350; 60-"Six," \$3150, and 40-"Four," \$1850—all completely equipped, electric started and lighted; left-hand drive, center control.

Demonstrations of all models are at your service at any of our hundreds of branches and agencies. Look up the KisselKar dealer in your locality, or write us for illustrated catalog.

### KISSELKAR SERVICE CONTRACT

The KisselKar is sold under a written guarantee of service to owners—a tangible, definite and specific contract that clearly stipulates the scope of Kissel-Kar Service and provides for care that forestalls trouble and retards depreciation.

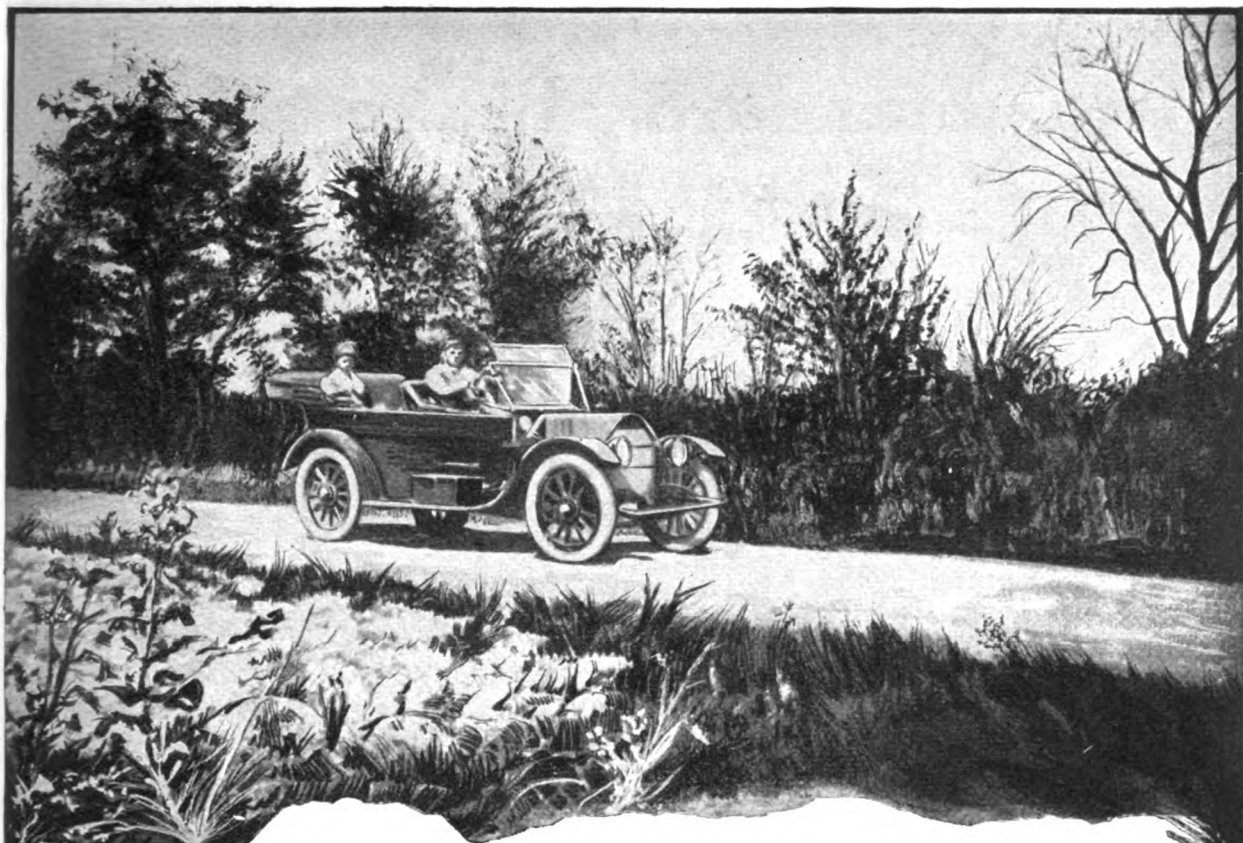
**KISSELKAR TRUCKS—SIX SIZES—1500 LBS. TO 6 TONS. WRITE FOR CATALOG**

**KISSEL MOTOR CAR CO., 174 Kissel Ave., Hartford, Wis.**

BOSTON, NEW YORK, CHICAGO, MILWAUKEE, KANSAS CITY, MINNEAPOLIS, ST. PAUL, DALLAS, SAN FRANCISCO, LOS ANGELES, OAKLAND, Philadelphia, Detroit, Houston, El Paso, Washington, Baltimore, Nashville, Duluth, Buffalo, Pittsburgh, Hartford, Conn., New Haven, Albany, Troy, Rochester, Providence, Cincinnati, Newark, Montreal, Quebec, Toronto, Winnipeg, Calgary and 300 other principal points throughout America.

When Writing to Advertisers, Please Mention The Automobile Journal.





KEEPS CARS WORKING WELL

**Polarine**

**Frictionless**

**Carbonless**

The Oil that really lubricates

*Use Standard Oil Company's Gasoline*



**Standard Oil Company**

OF NEW YORK



# The Standard Brake Lining

Every Industry Has Its Standard. In  
Brake Lining Circles The Standard Is

TRADE MARK  
**Raybestos**  
REG. U.S. PAT. OFF.

**"THE ORIGINAL AND BEST ASBESTOS BRAKE LINING"**

RAYBESTOS is the original heat-proof facing. By scientific weaving, rolling and treating, RAYBESTOS becomes a wall of strength, capable of resisting intense heat.



There are on the market many cotton linings. They are cheaper than RAYBESTOS but soon burn out. Asbestos, which cannot burn, is the base of RAYBESTOS.

The motorist, dealer, manufacturer, ALL realize the predominance of RAYBESTOS. It grips and holds—it is always ready for service.

When you overhaul your brakes demand RAYBESTOS. A little care in this will save you trouble and expense later on.

**It Made The Automobile Safe.**

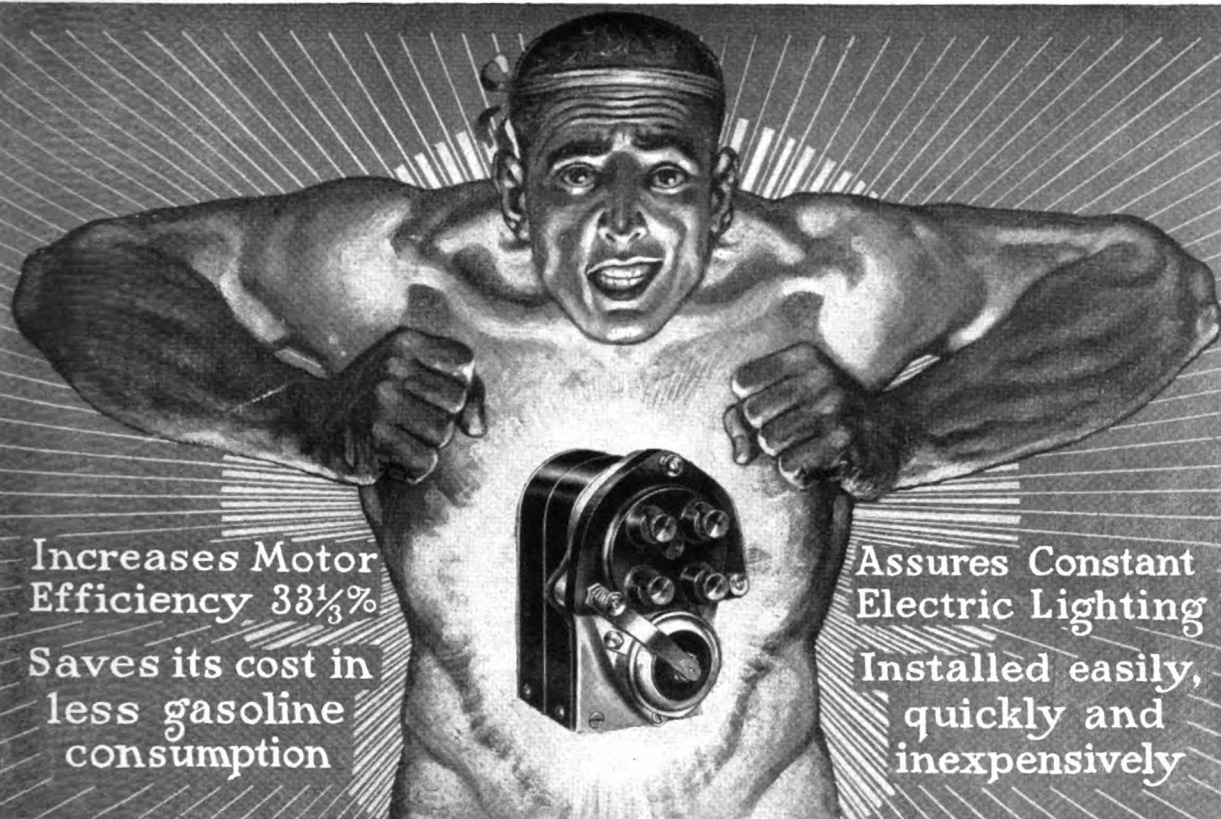
**THE ROYAL EQUIPMENT COMPANY**

**Railroad & Bostwick Aves.,  
Bridgeport, Conn.**

*We also make Raymond and Duplex Brakes and Gyrex the Mixer.*

When Writing to Advertisers, Please Mention The Automobile Journal.





Increases Motor  
Efficiency 33 $\frac{1}{3}$ %

Saves its cost in  
less gasoline  
consumption

Assures Constant  
Electric Lighting

Installed easily,  
quickly and  
inexpensively

## SPLITDORF "FORD SPECIAL"

### WATERPROOF HIGH-TENSION MAGNETO

The SPLITDORF ELECTRICAL Co. has harkened to the insistent demands of Ford owners and agents and has produced a thoroughly-tested high-tension magneto that promises to revolutionize the running of these remarkable cars.

Waterproof, and enclosed-gear driven, the Splitdorf "Ford Special" High-Tension Magneto is of special construction to meet the demands of Ford cars. With its installation the nuisance and expense of vibrators, coils and batteries pass away and a high-tension system secured that is second to none.

*Write or Call Today upon our nearest Branch House for full information*

## SPLITDORF ELECTRICAL COMPANY

ATLANTA, 10-12 East Harris St.  
BOSTON, 180-182 Mass. Avenue  
CHICAGO, 64-72 E. 14th Street  
DETROIT, 972 Woodward Ave.

KANSAS CITY, 1823 Grand Ave.  
LOS ANGELES, 1226 S. Olive St.  
NEWARK, 290 Halsey Street  
NEW YORK, 18-20 W. 63d St.

PHILADELPHIA, 210-12 N 13th St.  
SAN FRANCISCO, 1028 Geary St.  
SEATTLE, WASH., 1628 Broadway  
LONDON BUENOS AIRES

Factory: NEWARK, NEW JERSEY



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**FORD DELIVERY BODIES**, in stock and ready to attach. "LEW" FALES, Providence, R. I. 10-10

**FOR SALE**—21" back geared up-right drill, good as new; 4-h. p. gas engine, 14" machine lathe, number of speed lathes, etc. E. I. PURRING-TON, Wakefield, Mass. 10-10-1

**EVERY CAR OWNER SHOULD USE ELECTRIC POLISHING CLOTHS.** Keep the new car from looking old and shabby and make the old car look like new. No. 1 cloth removes all spots and stains. No. 2 cloth gives a hard dry polish that will not gather dust. Saves half the time in washing. Price 50 cents a set by Parcel Post. Order now. A. & R. Co., Wallingford, Conn.

IMITATED  
BUT NOT  
DUPLICATED

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THE OIL THAT SUITS  
AND DOES NOT SOOT.

Carbon in your cylinders means loss of power. Customers report 10,000 to 15,000 miles with no carbon troubles. A good motto: TRY ANYTHING ONCE. EAGLEINE NO-CARBON AUTO OIL is furnished in 1-5-10 gallon, 30 and 50 gallon Steel Drums with faucets for which no extra charge is made.

EAGLE OIL  
AND SUPPLY CO.

104 BROAD STREET, BOSTON, MASS.





# LIKE A THUNDER BOLT

Also made with 5 passenger Touring  
Car Body (115" wheel base) **\$850**  
Completely equipped



Vulcan 27 Speedster **\$750**  
Completely equipped

## The World's Greatest Light Car.

### THE VULCAN PLATFORM

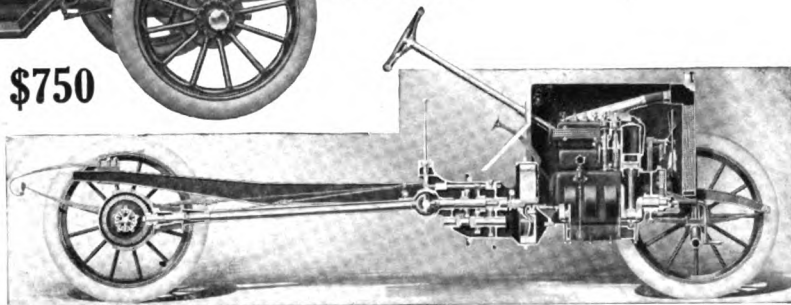
**27 Horse-power.**  
**3 3/4" bore—5" stroke.**  
**Unit power plant—3 point sus-  
pension.**  
**105" wheel base.**  
**32x3 1/2 tires all round.**  
**3 speed sliding gear transmission.**  
**5 pinion bevel gear differential.**  
**Left side drive.**  
**Center control.**  
**"Streamline" bodied.**  
Built strong and durable.  
Pleasing and graceful lines.  
Simple in design and construction.  
Easy to operate and steer.  
Will turn in 15 feet radius.  
Comfortable to ride in.  
A smooth running vibrationless motor.  
Silent in its action.  
Powerful and speedy.  
Economical on gas, oil and tires.  
Will climb any hill.  
Economical factory management.  
A sane sales policy.  
Greatest efficiency throughout the organ-  
ization.

—consequently—  
**Greatest value for the money**



from a clear sky **THE  
VULCAN**

**1914 Announcement**  
comes as a surprise (but  
a welcome one) to every  
dealer.



The clean cut Vulcan Chassis—Study the construction.

### FITS THE TREMENDOUS DEMAND

Thousands of dealers and prospective owners have been watching and waiting for the right car at the right price. You have often predicted that **some one** would bring out a car that would adequately fill the great popular demand. Others have hit all around the mark, but the Vulcan is the first to hit the bull's-eye.

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# Vulcan Mfg Co.

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# DER OIL

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## PUBLISHER'S COMMENT.

**The Automobile Journal for Nov. 25** will be the Annual Overhaul and Equipment Number, with particular reference to the preparation of the car for winter driving. Every phase of the subject will be treated exhaustively, this applying not only to the actual work of chassis overhaul, but to those accessories, supplies and fittings which make for comfort, convenience, safety and economy. Make certain that you shall not miss this, the most practical working guide and reference book of the season. Order now—direct, or through your news dealer.

**Everything indicates that 1914** is to be a small car year. That is to say, there will be an unprecedented number of new machines of this class. Keep well informed on the subject by watching the new department, on pages 39-40-41, this issue.

**Of course, you are interested** in the new things offered by manufacturers of accessories and supplies. You will find the latest news concerning these on pages 49-50-51.

**Always consult the Buyer's Reference and Guide** when considering the purchase of a new car or truck, or when in need of new supplies and fittings. The concerns represented therein have gained a reputation for standard products that merits your attention and patronage. See page 87.

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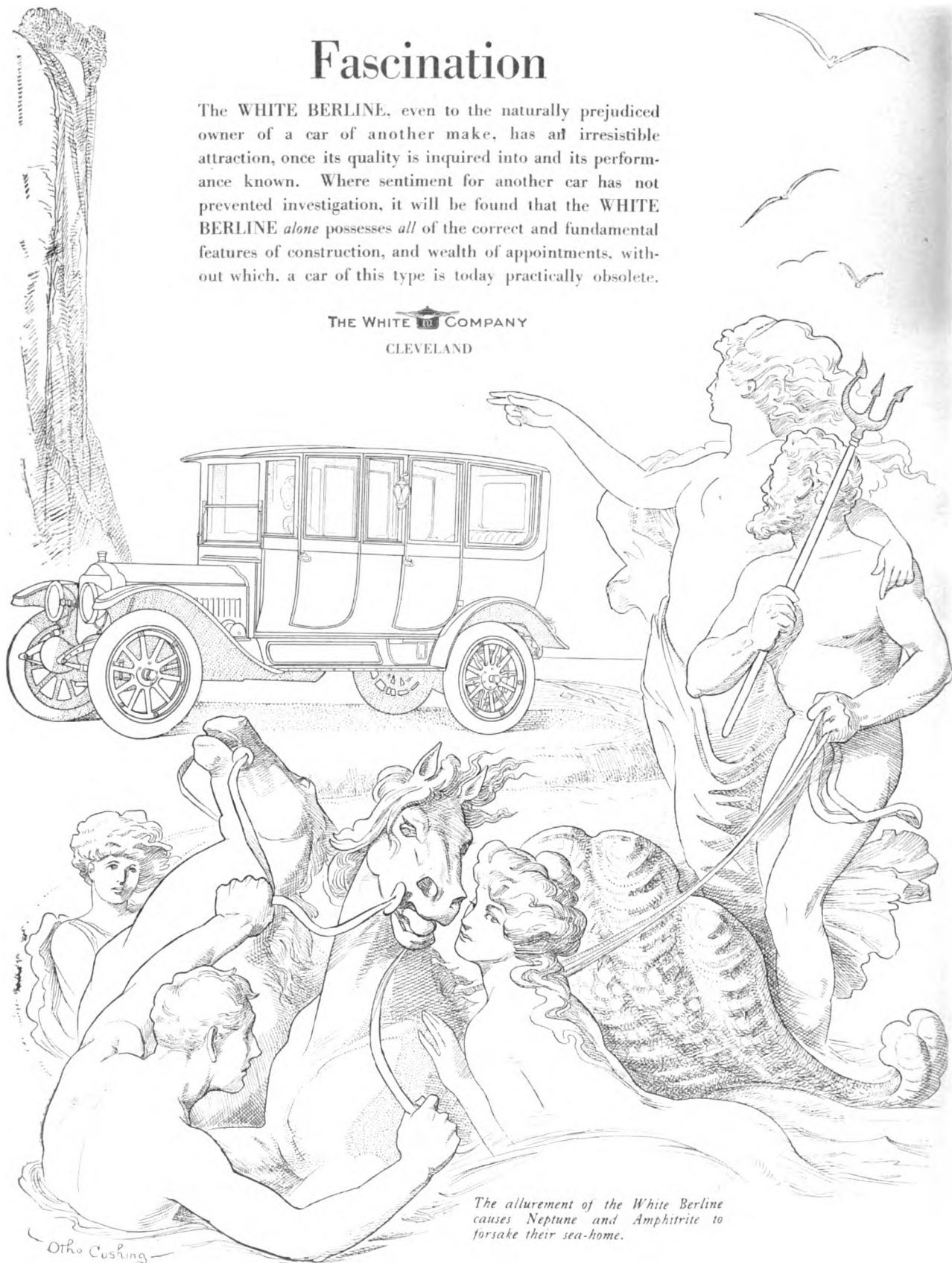
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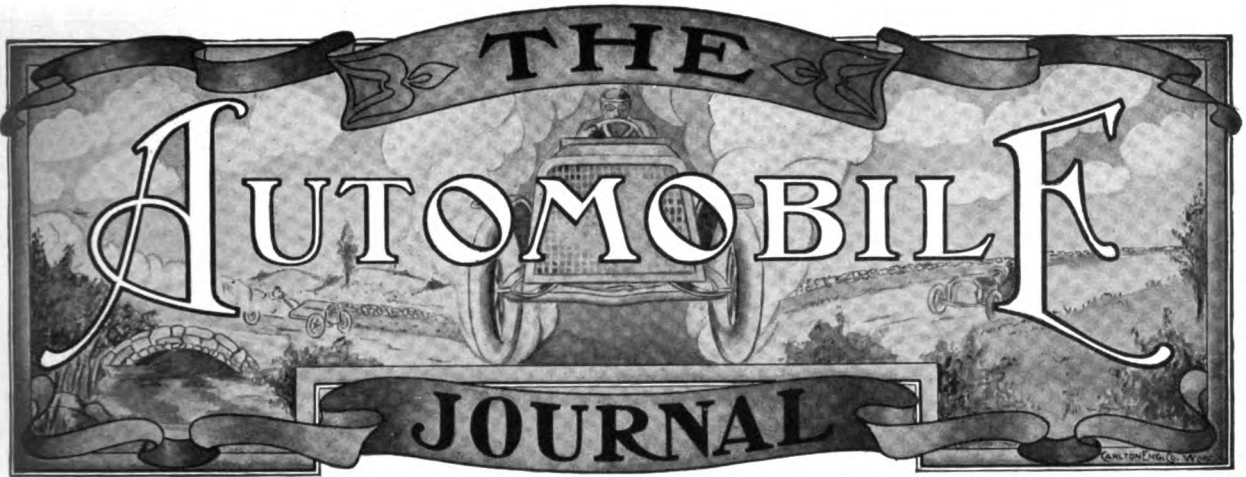


*The allurements of the White Berline causes Neptune and Amphitrite to forsake their sea-home.*

Otto Cushing

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VOL. XXXVI, No. 5

OCTOBER 10, 1913

Price, \$1.00 the Year

## THE LINCOLN HIGHWAY OF COLORADO.

**Splendid Example Set by Co-Operative Effort of Several Counties--Forms Important Link in Scenic Transcontinental Route--How Convicts Are Employed.**

**P**OSSESSED of scenic grandeurs surpassing in many respects those of any other country in the world, the people of Colorado, stimulated by the boards of trade, chambers of commerce and good roads organizations, have been actively engaged during the past three years in formulating highway plans, the working out of which is expected to make for increased tourist traffic. This movement had its inception in the minds of those who had become convinced that the reason Americans failed to "See America First" was due largely to the fact that many sections of the country which naturally would attract them did not offer the inducements, particularly with reference to highway facilities, that were available abroad.

At first the state highway commission, which must be given due credit for sensing the desires of the people, was hampered somewhat by legal entanglements which effect-

ually tied up state highway funds for a time. The matter at issue had to do with the question as to whether the legislative power of the common-

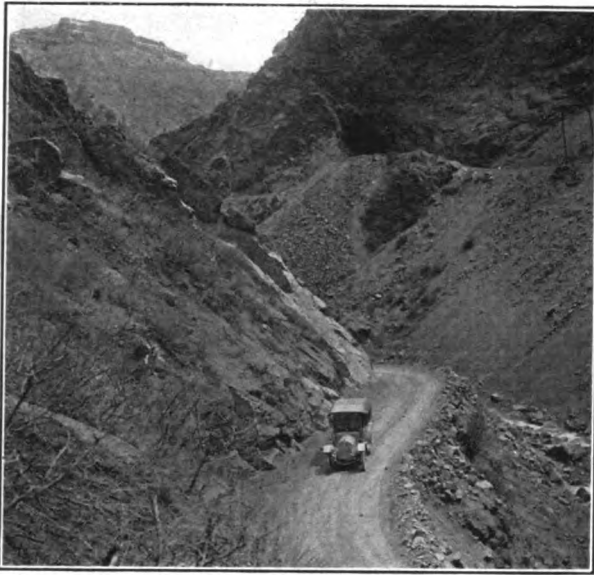
wealth was vested in the general assembly, or whether the initiative and referendum clause in the state constitution reserved such power to the people themselves. When this question was properly framed and the matter finally was placed before the people, they lost no time in enacting the necessary provisions. The state highway commission is now free to carry out its plans.

In the meantime, however, the organizations above mentioned had been busily engaged, with the result that the public is in full accord with the proposed system, under which Colorado is to build a number of so-called primary roads, connecting the principal centres, one with another, and forming a network of state highways. Chief among these is the Pikes



Where the Lincoln Highway of Colorado Enters the Historic Ute Pass.





**The Historic Gateway from Colorado Springs and Pikes Peak Region to the Mountain Country Beyond.**

Peak transcontinental route, renamed the Lincoln highway of Colorado, which crosses the central portion of the state, and connects with the Golden Belt road to Kansas City on the east and the Midland trail to Salt Lake City on the west.

As was to be expected, there is bound to be some confusion between this Lincoln highway of Colorado and the transcontinental Lincoln memorial highway of the Lincoln Highway Association of Detroit. This is particularly true, because the national route from New York to San Francisco, selected by the larger body, enters Colorado at Julesburg, visits Denver and turns northward to Cheyenne, Wyo., whereas the state route is as indicated by an accompanying map.

The Lincoln Highway Association of Colorado was formed at a conference in Colorado Springs, Feb. 7, 1912, the following counties being constituent members: Kit Carson, Lincoln, Elbert, El Paso, Teller, Park, Chaffee, Lake, Eagle, Pitkin, Garfield and Mesa. It is claimed by this association that this was the first link in any transcontinental highway to be named officially in memory of the martyred President, and that recognition of this fact was given by the Colorado Good Roads Association, the state highway commission, the American Automobile Association and other equally important authorities.

Since the organization of this association, approximately \$200,000 has been expended by the counties and the state, and the work now completed, under way or contemplated for this winter assures a permanent, first class highway from the Kansas to the Utah line. In many places, convict labor is being employed and Garfield

county has contracted with the state for a gang of 40 convicts for four years for work on its portion of the road.

The Lincoln highway of Colorado connects just east of Burlington, Col., at the Kansas line with the Golden Belt road of Kansas and is a continuation of that road from Kansas City, as well as the Rock Island highway from St. Joseph, Mo. It continues westward through central Colorado straight to the mountains, and enters the range at Manitou. It next follows the historic Ute pass, through which, centuries before the coming of the white man, Ute Indians had worn a trail from their homes to the healing springs at Manitou and to their worshipping grounds in the Garden of the Gods in the Pikes Peak region. It crosses the South Park district to Buena Vista, thence up the Arkansas river to Leadville, surmounting the Continental Divide by a gradual ascent over Tennessee pass. An alternate route is now under construction by way of Independence pass. From the crest of the continent it descends by way of Eagle canyon and the Canyon of the Grand to Glenwood Springs, and down through the Grand valley to Grand Junction and the Utah line.

This highway traverses a country rich in scenic and historic interest. Crossing the plains of eastern Colorado, the motorist sees where the pioneers of a new, scientific agriculture are building up an empire in the footsteps of the "fortyniner," the Indian and the buffalo. As the journey progresses westward, the dim outline of Pikes Peak is seen in the distance, and the signifi-



**Convict Labor Has Been Engaged for Six Years in Cutting the Granite Walls of the Ute Pass.**





Where the Highway Traverses Western Section of Grand Canyon, Near Glenwood Springs.

cance of the "Pikes Peak or Bust" days is impressed upon the modern traveller. In the Pikes Peak region a wonderful variety of mountain scenery is unfolded to the tourist, with automobile roads leading in every direction. One of these, the Colorado Springs-Canyon City state highway, has just been completed. It was built entirely by convict labor and is conceded to be one of the finest motor roads in the West.

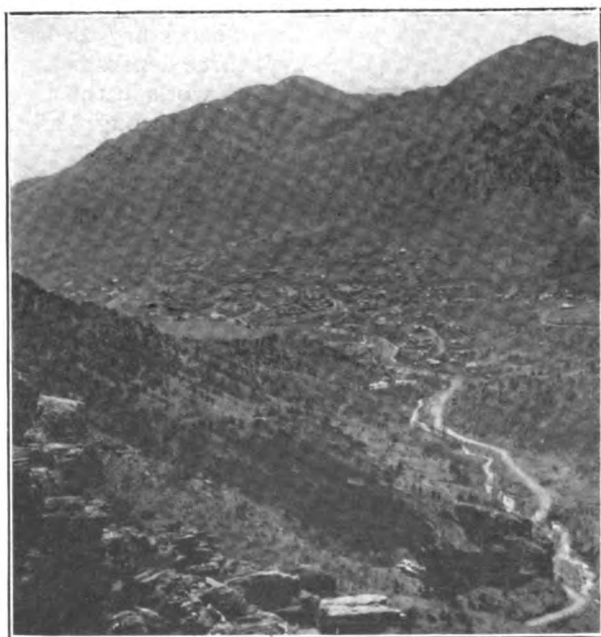
Manitou, with its wonderful mineral springs, is at the gate of Ute pass. At Florissant, are the fossil beds and the petrified trees, and opportunity may be had to visit Cripple Creek, the world's greatest gold mining camp, only 17 miles distant. At Lake George, the tourist reaches the fishing country, and from this point along the entire journey he is within constant touch with some of the best trout fishing streams in the country. Near Buena Vista, the first view of the snow capped peaks of the Continental Divide appears, and at the crest of Tennessee pass the motorist is 10,200 feet above sea level. It is maintained that this is one of the most accessible of all the mountain passes, because it must be kept open during the winter months, in order to enable ranchmen to bring their produce into the city of Leadville, world famed as a mining camp.

The Independence branch joins the main road at Twin Lakes, and descends the western slope by way of Aspen and the picturesque Roaring Fork valley. It rejoins the Tennessee pass route at Glenwood Springs, with its natural hot water pool and its many points of scenic interest. Beyond Glenwood Springs the road passes through the finest orchard sections of the Grand valley.

Colorado's employment of convict labor, not only on this highway, but on other roads within

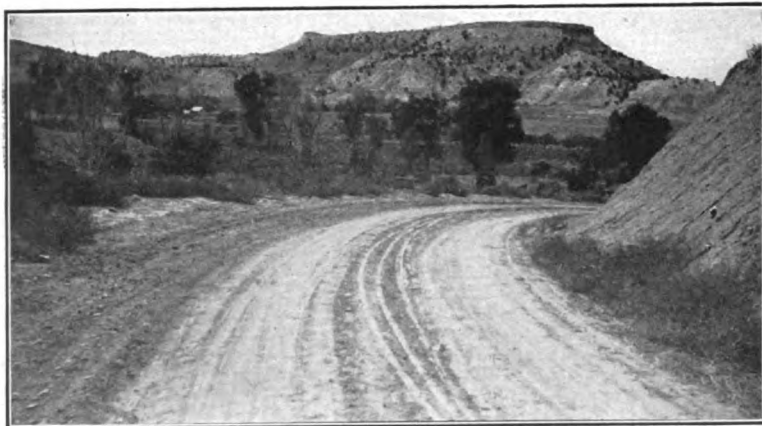
the state, has proven highly successful, and it is held to be a factor that is rapidly bringing that commonwealth to the fore in the development of its state highway system. According to the report of the warden of the state penitentiary, 157 miles of roadway were constructed during the last biennial period, at an estimated saving to the counties of \$223,479.56.

The convicts have been employed largely upon the mountain and more difficult roads, and the model highways they have constructed have stimulated road improvement and development in every section. Convicts at work on the roads and in camp are allowed much of the freedom of the ordinary camp, and are placed on the honor system. There is only one unarmed guard on duty at each camp at a time. The practicability of this plan has been demonstrated by the small percentage of escapes attempted during the six years that work of this nature has been carried on. Care, of course, is exercised in the selection of men for road work and 10 days' time is deducted from the convict's sentence for each month's work on roads, this being in addition to the regular allowance for good behavior. The outdoor life appeals to the men, who strive to be placed on the road gangs, and the work is highly beneficial physically, as well as morally, to the convicts themselves. At least, this is the view taken by Colorado, which has been one of the pioneer states in the adoption of this convict labor plan, its methods having been copied in



Looking Westward Toward the Mountains Near Manitou in Central Colorado.





**A Section of the Colorado Springs-Canon City State Highway, Recently Completed by Convict Labor.**

many other sections of the United States.

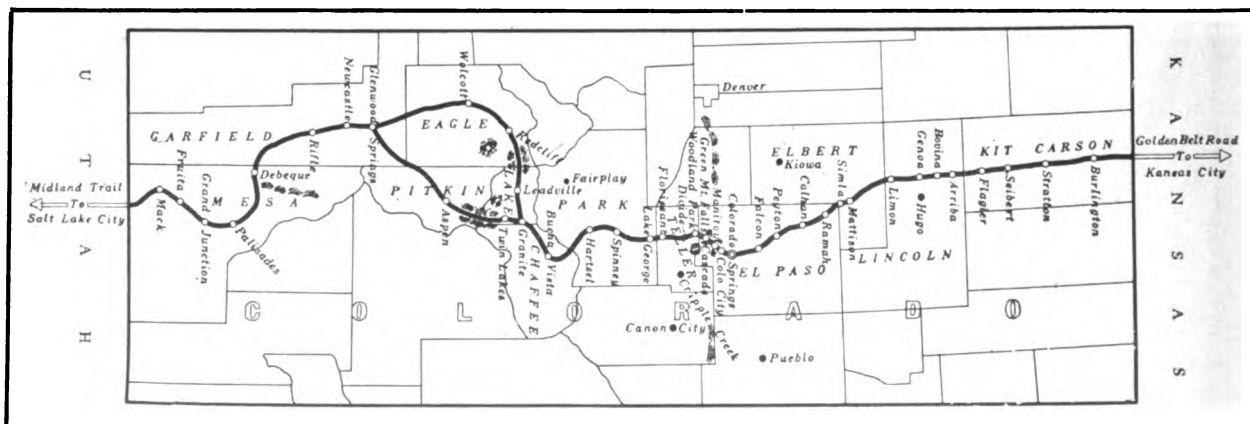
According to the figures given by the warden, the work has been done at an average cost to the various counties of 32 cents a day a man, this cost including Sundays and holidays. In addition to the convicts, 21 state teams were employed, the feed for these averaging \$20 a month a team. The average labor cost for the 157 miles worked was \$298.12 a mile.

As has been stated, much of this work was on the Lincoln highway of Colorado. The work in Mesa county alone would have cost, according to the warden's estimate, not less than \$25,000 a mile under free labor. This was due in a large measure to the fact that in places the rock had to be blasted for 75 feet in order to get a proper road bed. In this work it was necessary to drill holes 25 feet deep, and to drill three depths before the road bed was reached. The work in the Ute pass, in El Paso county, was done through solid rock for six miles—all blasting.

This necessarily would have been very expensive work had it been done with free labor, and

the counties would have been forced to pay big salaries to drillers, blasters, powder men, masons and cement workers. Not counting the contractor's profits and not including any skilled labor, except blacksmiths, cement workers and masons, the warden estimates that the value of free labor would have been \$161,040. He places the cost of free labor and teams at \$266,285. He says the state worked an average of 20 masons and cement workers, and five blacksmiths, and he maintains that none of this labor competed with free labor of the state, for the reason that the counties could not otherwise have afforded to do this work.

It may be added that the work on the Lincoln highway of Colorado is to a uniform width throughout. Across the plains the material is mainly a sandy loam or gravel, with very little adobe or clay. There are few important bridges as the streams are small. Concrete is utilized in bridge work in many places throughout the state. In the mountains, and particularly wherever blasting work has been necessary, the road surface is of disintegrated granite. There are few heavy grades, and for the most part these are short. Wherever practicable the grades have been reduced, so that the climbing is gradual and easy. From the Kansas line to Colorado Springs the route has been very carefully marked with markers composed of a red, white and blue band. This work is now being continued along the western half, so that this should be one of the easiest transcontinental routes for the tourist to follow. Moreover, it sets an excellent example for the various other roads, on which the state highway commission is actively engaged.



**Map of the Pikes Peak Transcontinental Highway, or the Lincoln Highway of Colorado, and Its Connections.**





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## HAYNES FEATURES ELECTRIC GEARSHIFT.

**F**OR the season of 1914 the Haynes Automobile Company, Kokomo, Ind., has increased its line by the addition of two new models, both equipped with six-cylinder motors, and these, with the four, are featured with the Vulcan electric gearshift. Option is given of the conventional hand gear lever, however, at a reduced price. The company continues its policy of fitting a number of different body styles, these including a two-passenger roadster; four, five, six and seven-passenger touring; coupe and limousine. The last named type is fully enclosed, of seven-passenger capacity, and fitted to the model 27 chassis.

The new line presents a number of new features. The driver is placed at the left with the emergency brake lever in centre, and a pressure fuel feed with large capacity tank suspended at the rear of the chassis replaces gravity. The policy of the company to offer every convenience is noted in the adoption of a motor driven tire pump; the provision for ample storage space, and the continuation of the Leece-Neville electric lighting and motor starting system. Many refinements are noticeable and the equipment, as usual, is very complete.

The new chassis are designated by serial

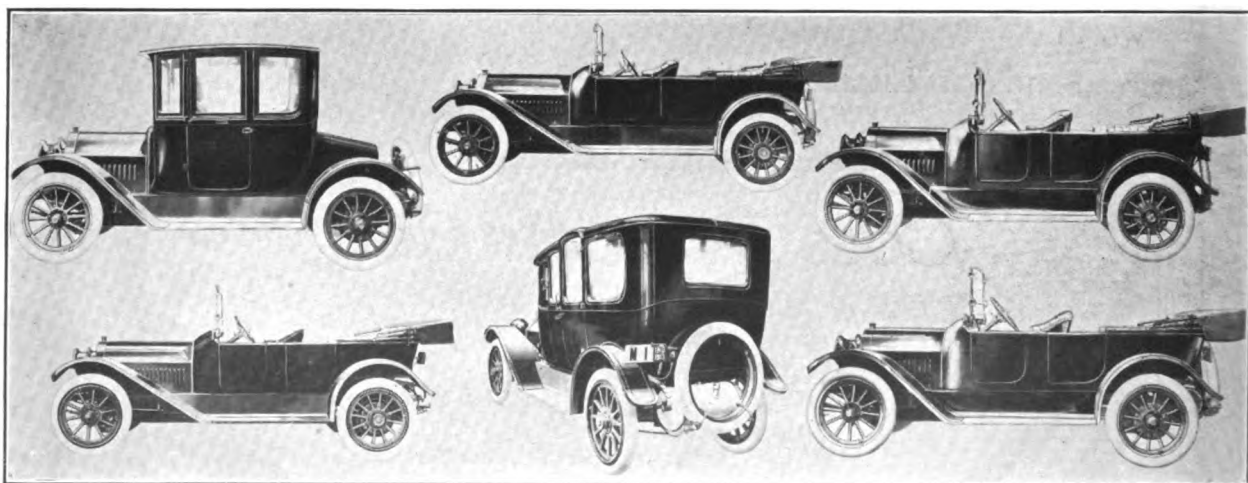
### DETAILS OF 1914 HAYNES LINE.

**Vulcan Electric Gearshift on All Three Models.**  
**Option of Hand Gearshift at Reduced Price.**  
**One Four and Two Six-Cylinder Models.**  
**Bore 4¼, Stroke 5½ with All Motors.**  
**Left Hand Control, Emergency Brake at Right.**  
**Pressure Feed, Fuel Tank Suspended at Rear.**  
**Electric Lighting and Motor Starting.**  
**Two-Cylinder Gear Driven Power Tire Pump.**

the latter 136. Model 28 has a four-cylinder power plant. All cylinders have the same bore and stroke, 4.25 by 5.5 inches, the stroke being the same as last season and the bore being reduced slightly. The S. A. E. rating of the four-cylinder engine is 28.9, which brings it within the

line of demarcation, 30 horsepower, in those states utilizing the rating as a basis in computing registration fees and providing a class of 20 to 30 horsepower inclusive. The factory dynamometer rating, however, is 48. The horsepower production of the larger motor is 65, although rated at 43.8 by the S. A. E. formula.

The Haynes company has joined the ranks of makers of the L head type of motor with the valves located on the right and enclosed by easily removed plates. The crankshaft is two inches in diameter, of chrome nickel steel, and is slightly offset from the cylinders. The total length of the bearings on the four-cylinder unit is 11.5 inches and 14 on the six, proportions making for durability and efficiency. The connecting rod length is 11 inches, from centre to centre, reducing side thrust to a minimum, while the piston is 5.125 inches long, carrying four .25-inch rings. The wristpin is of chrome nickel steel, 1.125 inches in diameter by 2.8125, and oscillates in the piston bosses. The camshaft is constructed from 30-



Presenting Some of the New Body Designs of Haynes 1914 Line, Comprising Three Models—Two Sixes and a Four.

numbers, models 26 and 27 being fitted with six-cylinder motors and differing only in the length of wheelbase, the former being 130 inches and

point carbon steel, is 1.125 inches in diameter and is carried in three bearings on the six-cylinder motor, which has a total length of bearings of

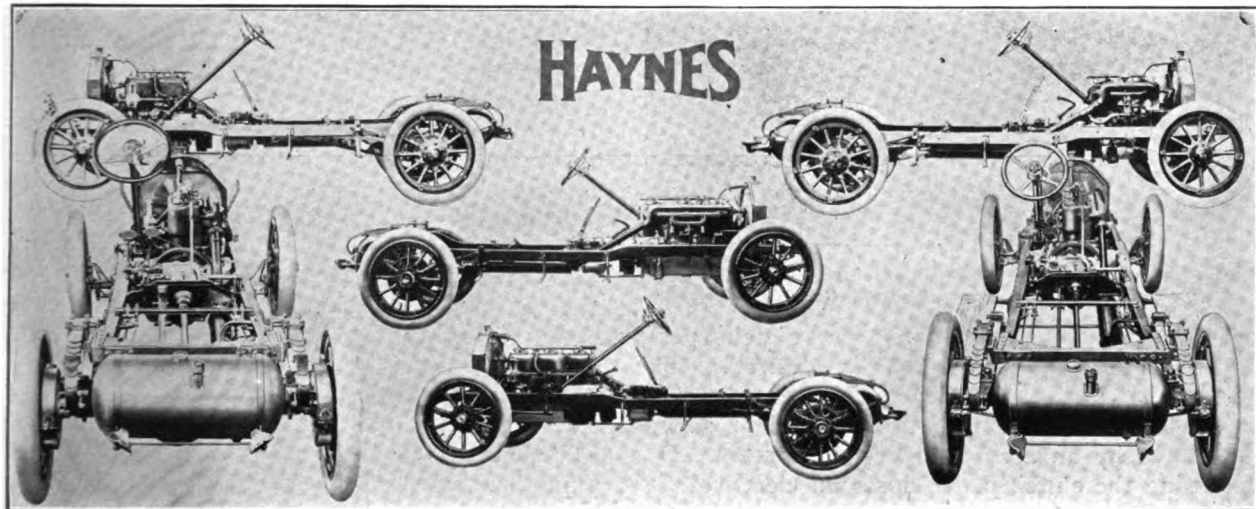


16.125 inches. That of the four is 11.9375 inches. All cams are integral.

The cylinders are cast in pairs and have large water jackets. Cooling is by a centrifugal pump, aided by a large pressed steel adjustable belt

lubricating the large end, also splashing oil to the piston, walls, etc. A tapered groove directly under the lower ring displaces surplus lubricant.

The pressure pump is of the plunger type, with a check valve in the line to the tank, ports



**Illustrating the Mechanical Details of the Haynes Chassis, Having Electric Gearshift, Lighting and Motor Starter, and Power Tire Pump.**

driven fan. The radiator is of the cellular type, of ample capacity to meet the requirements of the most severe service. It is 3.875 inches thick on the six and three on the four. Carburetion is by a Stromberg and ignition by the latest type American Simms magneto, which produces a hot spark fully retarded.

Both the oil pump and that maintaining air pressure in the fuel tank are actuated by an eccentric on the camshaft. The lubrication system of the Haynes is simple and efficient, the supply being in proportion to motor speed, and it is held that smoking and carbon are eliminated. The oil is drawn from the lower section or compartment of the crankcase, forced through a sight feed on the cowl board, thence to a distributing manifold in the upper section of the case. It flows by gravity through outlets in the manifold to troughs connecting with the main crankshaft bearings, to a hollow idler gear stud, and to individual compartments under the connecting rod. The lubricant from the main bearings overflows to the sump; that from the idler gear stud to the timing gears, thence to the base, where it is screened before again being circulated. Hollow scoops on the connecting rods dip into the oil,

being utilized for the admission of air. The pump is provided with a safety valve having adjustable features for obtaining varying pressures. Both the fuel and air lines are annealed copper tubing with walls of ample thickness. The fuel tank is suspended at the rear of the chassis by heavy cast steel brackets, which also serve as tire carriers. The tank is of heavy drawn sheet steel, a two-piece member, one head and the full length being constructed of one sheet of metal. The other head is inserted and welded into position. A gauge and a convenient filler are provided. The adoption of the pressure feed system permits of carrying the carburetor higher than formerly, and in proximity to the jackets, assisting in carburetion.

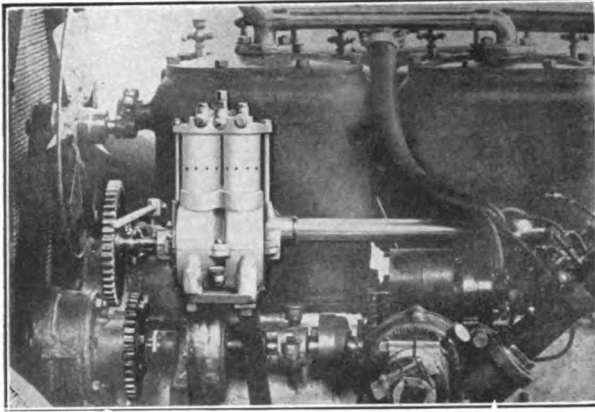
The transmission is of the selective type, providing three forward speeds and one reverse, and the gears are constructed of 3.5 per cent. nickel steel, have .875-inch face and are made in an electric furnace. The shafts are liberal in dimensions, of chrome nickel steel and Timken roller bearings are utilized throughout.

The Vulcan electric gearshift has been completely described and illustrated in these columns. In brief, it relieves the driver of all exertion other than pressing

#### 1914 HAYNES BODY STYLES.

- Model 26 6-Cyl. Two-Passenger Roadster.
- Model 26 6-Cyl. Four-Passenger Touring.
- Model 26 6-Cyl. Five-Passenger Touring.
- Model 26 6-Cyl. Coupe.
- Model 27 6-Cyl. Six-Passenger Touring.
- Model 27 6-Cyl. Seven-Passenger Touring.
- Model 27 6-Cyl. Limousine.
- Model 28 4-Cyl. Two-Passenger Roadster.
- Model 28 4-Cyl. Four-Passenger Touring.
- Model 28 4-Cyl. Five-Passenger Touring.
- Model 28 4-Cyl. Coupe.

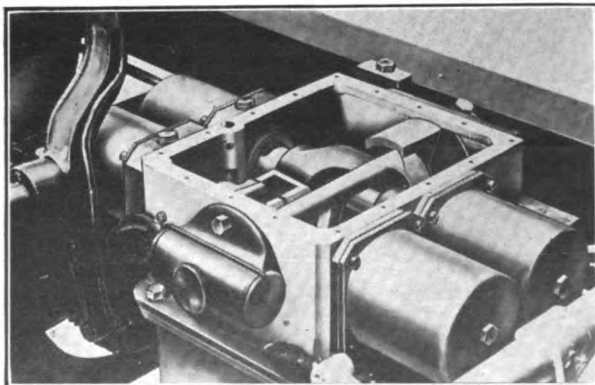




**Showing Location and Compactness of Power Tire Pump and Method of Meshing Gears.**

a button and depressing the clutch pedal when a change of speed is desired. The control unit is mounted on the steering wheel and is very compact and convenient, as will be noted by an accompanying illustration. Depressing the clutch pedal closes an electrical circuit, actuating electro-magnets or solenoids, drawing the desired gear into mesh, providing an instantaneous change and eliminating danger of stripping the gears. The Haynes company subjected the device to severe tests before adopting it.

Drive to the rear axle is by shaft, a Hartford double joint universal being employed. The axle of the four-cylinder model is of the full floating type, a McCue, of ample dimensions and having 12 and 16-inch brakes of the internal type. Large diameter ball bearings are utilized throughout. The front axle is also a McCue. A Timken rear axle is employed with both six-cylinder models, in which brakes are of the external and internal type, 16 and 15.5 inches in diameter, respectively. The material in both axle housings is pressed steel and gears and shafts are of chrome nickel

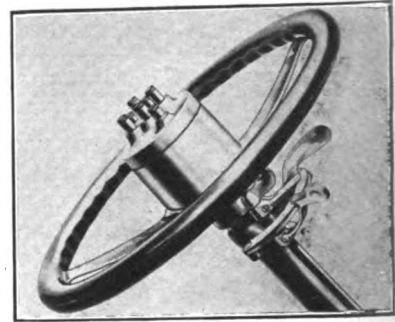


**Presenting Neutralizing Cam of Electric Gearshift and Arrangement of Solenoids.**

steel and of ample proportions. Timken front axles are used on models 26 and 27. The spindles are of chrome nickel steel, 1.5 inches in diameter, with the axle of I beam open hearth steel, heat treated. Wire wheels are optional.

The steering gear is a Warner, of the worm and worm gear type, and easily adjusted as to wear. The frame is made from .1875-inch hot rolled, cold pressed steel and the cross section and depth dimensions are very liberal. A double drop provides a low centre of gravity, also permitting of lower suspension of the body. The springs are of ample length, of carefully selected high grade steel, ground and polished, and insure comfortable riding qualities. The spring bolts are of nickel steel, hardened and ground, and the grease cups are integral with the spring bolt. All spring eyes have hardened steel bushings.

The power tire pump fitted to the Haynes motor is not only light and compact, but very efficient. The pump is actuated by gears, the driven member being thrown into and out of mesh with the driving gear by means of a hand lever. Fifteen feet of high grade hose, ample to reach any tire valve on the car, and a 120-pound capacity gauge are supplied with each pump. The lighting dynamo and motor starter are separate units.



**Control Switch of Electric Gearshift, on Steering Wheel.**

The bodies of the Haynes are the result of much study and careful designing and the upholstery is deep and luxurious. Ample room is provided in both the front and rear in the touring models and the doors are extra wide, upholstered in leather. All hinges are concealed. The cowl is constructed from one piece of metal and curves gracefully to the hood. The body styles of the four-cylinder model are replicas of the six, insofar as design is concerned, one simply being larger than the other. The design, upholstery and appointments of the coupe and limousine are particularly attractive, the doors being wide and the body curves graceful. The standard color is Indiana dark blue with black gears and wheels. Option is given of a Pacific Tour gray body. The finish is particularly high grade, a large number of coats making for durability. The equipment is very complete.



# BOSCH MAGNETO EQUIPMENT FOR FORD.

**B**ELIEVING that there is a demand for a Bosch magneto on model T Ford automobiles, the Bosch Magneto Company, 225 West



Fig. 1—New Bosch Switch Used with System.

46th street, New York City, has perfected and is manufacturing a Bosch-Ford equipment which presents interesting features in that it may be installed without any alterations, machining, etc., and among its advantages is that its fitting requires no other knowledge than that of timing the magneto.

The instrument in place and method of drive is shown at Fig. 2, and it will be seen that a silent chain sprocket replaces the usual timer and that energy is transmitted by a silent chain to another, smaller sprocket, mounted on the armature shaft of the magneto. Crankshaft speed is obtained by utilizing a 30-tooth sprocket on the camshaft (timer shaft) and employing a 15-tooth sprocket on the magneto.

The sprockets are made carefully and have a guide to prevent any possibility of the chain running off in operation. The efficiency of the silent chain method of drive is well known. In the Bosch installation the proportions and material have been given careful consideration, and the drive has been well tested before announcing the equipment.

The method of mounting the magneto is novel and the design is sturdy. By referring to Fig. 3 it will be seen that the bracket is so formed that it fits neatly to the left hand side of the motor, being secured at the bottom to the crankcase by the second and fourth bolts. The upper portion of the bracket is secured by the first two or forward bolts retaining the cylinder head. As the holes are accurate, no fitting is required, the bracket slipping easily into place. Being constructed of aluminum, weight is reduced to a minimum and it does not detract from the appearance of the power plant. The magneto is mounted on a shelf or base and is provided with slotted holes so that the instrument may be slid

inwardly or outwardly to compensate for any wear or stretch of the chain, and it is obvious that the arrangement facilitates installation.

The magneto is the well known Bosch DU4, a true high-tension instrument, eliminating batteries, coils, timers, etc., and capable of producing a hot spark on a quarter-turn of the starting crank. Variable advance is provided, the circuit breaker box being advanced or retarded as desired by the usual movement of the spark lever. The conventional connection is utilized, a rod being fitted to it and attached to one end of an extended bell crank as shown at Fig. 2. The other end of the extension bell crank is attached by a small arm to the breaker box. No alterations or fittings are necessary, as the rod is accurately proportioned.

A new switch has been designed for the equipment and is fitted in the dash. The switch, which is shown at Fig. 1, has a button and key in combination, which can be removed in the same manner as an ordinary key, thus locking the ignition. A metal plate is provided to cover the opening left by removing the usual coil. A rear view of the switch, also the method of carrying the high-tension wires, is shown at Fig. 2.

The wiring is very simple, as indicated by the diagram presented at Fig. 4. Four leads are utilized between the distributor and the spark plugs, while a primary wire is connected to the ter-

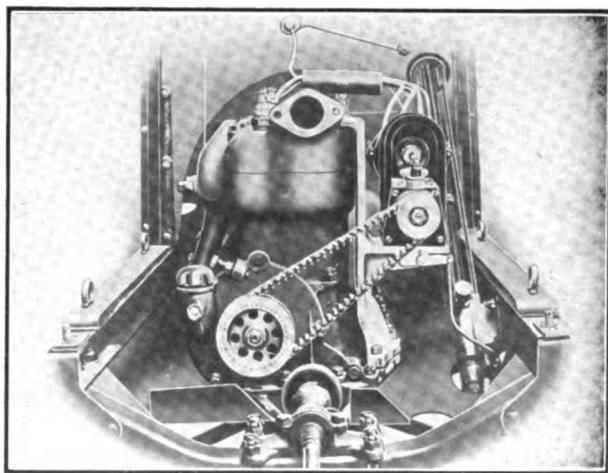
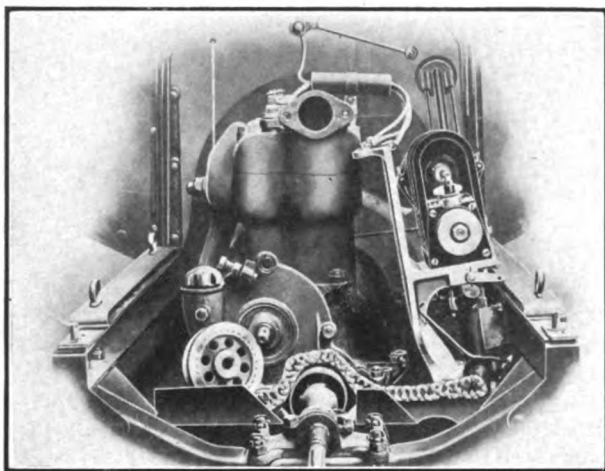


Fig. 2—Bosch-Ford Equipment, Including a True High-Tension Magneto Driven by Silent Chain from Sprocket on Camshaft.

minal on the breaker box and led to the switch, thence to ground. As indicated in the drawing, the magneto would supply current to the plugs as



the switch is open. Closing it diverts the primary current to ground. This is accomplished by the push button switch above referred to.



**Fig. 3—Showing Driving Sprocket Ready for Attachment and Aluminum Bracket Which Is Bolted to Motor—No Alteration or Fitting Is Required.**

The firing order and direction of rotation of the armature shaft and distributor are given in the wiring plan and it will be noted that the magneto is driven anti-clockwise, consequently the distributor revolves clockwise. The proper connection of the leads to the spark plugs is also shown and the simplicity of the wiring is apparent.

To install, the radiator is displaced, also the priming wire, fan and pulley assembly and the rod connecting the spark control with the timer. The last named member is next removed with its wires and discarded. The hexagon nut utilized to secure the timer is re-employed to retain the driving sprocket, which is also held by a special key pin supplied with the equipment. By doubly locking the gear there is no possibility of its slipping or working loose in service.

The magneto is next set on its bracket, aligned and the timing rod attached to the ball crank. The timing of the DU4 magneto is practically the same as with other cars. The piston of the first cylinder (that nearest the radiator) is brought to the top of the compression stroke and the armature shaft rotated by hand until the distributor brush rests on the No. 1 segment. With the timing lever or spark fully retarded, the armature is turned in its direction of rotation until the platinum contact points begin to separate. The chain is then fitted. The only precautions to be observed are: Not to rotate the armature after the proper setting is obtained or change the position of the piston.

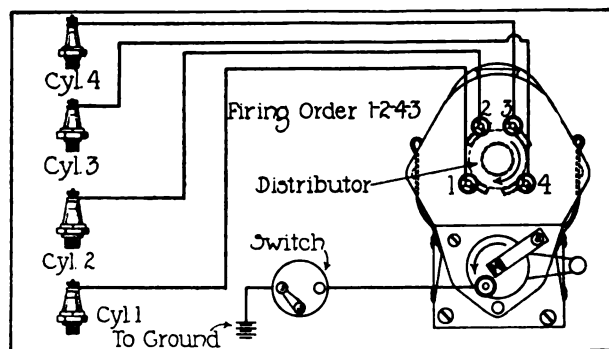
The advantages obtained with a magneto are numerous. Synchronization of the spark is assured, coils and their adjustment eliminated, an inexhaustible source of current supply provided, more power and greater motor efficiency by reason of a more complete combustion of the fuel. The improvement over the conventional coil system is marked, and the results obtaining with a Bosch magneto on a model T Ford were outlined in The Automobile Journal of May 25, the writer being present at tests made before and after the installation of the instrument. The Bosch-Ford equipment is adaptable to all Ford motor cars produced since 1910 and will be carried in stock at the home office and branches.

### BUYS MEZGER SPARK PLUG.

**Production Will Be Known in the Future as the J-M (Mezger) Soot-Proof.**

The H. W. Johns-Manville Company, New York City, announces that it has just taken over the manufacture and distribution of the Mezger Soot-Proof spark plug, which will be known in the future as the J-M (Mezger) Soot-Proof. Under the terms of the sale, R. M. Owen & Co., New York, distributor for Reo and Premier cars, will retain its interest in this product. The former maker was C. A. Mezger, Inc., New York City.

The plug has been on the market since 1900, and is said to be one of the first American designed and built on scientific principles. Over 400,000 have been sold for use on America's leading cars. The H. W. Johns-Manville Company will provide increased factory facilities to meet a growing demand, and mechanical devices of the



**Fig. 4—Wiring Plan of Bosch Magneto on Ford—The Direction of Rotation of Armature and Distributor Is Indicated by Arrows.**

latest and most approved design will be installed. Those interested in spark plugs will receive a neat little booklet describing this product in detail by making request of the new owner.



### BUILDS HAYNES CARS.

#### A. N. Wilhelm Is Factory Superintendent of the Pioneer Kokomo Concern.

Sometimes the motoring public fails to consider the important part played by the mechanical force in the production of a given car. The work of the designer, the sales manager and, perhaps, other officials of the concern, is given due weight, but it is seldom indeed that the man who sees the actual work of construction is given more than a passing thought. Of course, this comment could be made to include the workmen as well, but it undoubtedly will be conceded that the efforts put forth by the rank and file are a reflection of the personality of the factory superintendent.

A. N. Wilhelm, factory superintendent for the Haynes Automobile Company, Kokomo, Ind., pioneer American gasoline automobile manufacturer, was born and reared on a farm outside the little town of Winamac, Ind. It was not until his 20th birthday that he migrated to Peru, where he apprenticed himself to the Peru Electrical Manufacturing Company. At the end of nine years with this concern he had developed into one of the most expert machinists in the country.

In 1903 he began making tools for the Haynes Automobile Company. Under the tutelage of A. G. Seiberling he progressed so rapidly that when the latter temporarily severed his connection with the company the mechanic accompanied him. Neither man forsook the industry, however, so that the five years' change may be said to have broadened their experience. In the fall of 1912 both returned, one in the capacity of general manager and the other as factory superintendent. The latter set for himself the task of increasing the production of Haynes cars, and, as has been the result with every task he has undertaken, he is succeeding.

### BUYS McCUE WHEEL PLANT.

#### George W. Houk to Operate Factory Under the Name of Houk Wire Wheel Company.

George W. Houk, president of the George W. Houk Company, Philadelphia, which concern owns the American rights to the Rudge-Whitworth wire wheels made in Great Britain, has

purchased the plant, good will, stock in trade and business of the McCue Company, 1700 Elmwood avenue, Buffalo, N. Y., where the McCue wire wheels have been made during the past two years. It is understood that the purchase price was \$400,000, in addition to assuming an indebtedness amounting to some \$38,000.

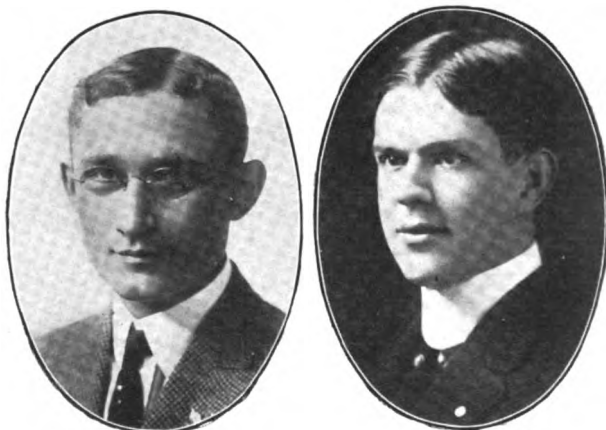
The plant is to be operated by the Houk Wire Wheel Company, a new concern capitalized at \$900,000, \$400,000 of which is preferred stock carrying a six per cent. dividend. George W. Houk is to be president and W. F. Evans, general manager of the McCue Company, is to assume the management of the new organization.

It is stated that the company will manufacture a wire wheel, embodying the features of the Rudge-Whitworth, although of somewhat different design. It is assumed that it will carry the Houk demountable rim, heretofore manufactured by the George W. Houk Company, which is to continue as distributor of the product.

### BUICK COMPANY CHANGES.

#### J. T. Wilson to Succeed E. J. Copeland as Purchasing Agent for Flint Concern.

E. J. Copeland, for the past three years purchasing agent for the Buick Motor Company, Flint, Mich., has resigned to go with the Corcoran Lamp Company of Cincinnati, O., as general manager. James T. Wilson, for the past four years buyer for the Durant-Dort Carriage Com-



At Left, E. J. Copeland, Who Resigns as Purchasing Agent of Buick Motor Company, and at Right, James T. Wilson, Who Succeeds Him.

pany, also of Flint, will succeed to the position. He has already assumed a portion of his new duties, although Mr. Copeland will not leave the Buick concern until the first of the year.



Mr. Copeland succeeds Thomas Corcoran, who will devote his entire attention to the factory end of the lamp business. That he is well qualified for his new responsibilities is indicated by the fact that during the three years of his service with the Buick company the purchases have averaged a little over \$20,000,000 a year. He began with this concern as stenographer for H. E. Shiland, at that time sales manager, and within 30 days was made assistant purchaser.

### ENJOYS ITS BEST YEAR.

#### Sales and Profits of National Motor Vehicle Company Largest in Its History.

The annual report of the National Motor Vehicle Company, Indianapolis, Ind., made at the recent annual meeting, showed that the sales and profits for the fiscal year, ending Sept. 1, 1913, were the best in the 14 years of the company's history. The stockholders were so well pleased with the showing that a resolution of thanks and congratulations was



George M. Dickson, General Manager, National Motor Vehicle Company.

passed giving a large measure of credit for this success to the untiring efforts of General Manager George M. Dickson.

As the result of the election, the old board of directors was continued in office, this comprising A. C. Newby, Robert Martindale, P. W. Manchester, William Guy Wall and George M. Dickson. Last year's officers also were re-elected as follows: President, A. C. Newby; vice president, W. G. Wall; secretary and treasurer, George M. Dickson. At the conclusion of the meeting Mr. Dickson issued a statement, which read in part as follows:

The National stockholders were of the firm opinion that one of the elements entering into their company's success has been the firm policy of building a quality car and not catering to fads, single season styles or any ex-

perimental changes, in order to lure sales. We build on the series basis, every day beginning a new year with us. We are constantly improving, perfecting and developing our cars and not upsetting all our manufacturing efficiency and economy by constantly changing models with the seasons. The result is that we have accumulated experience to go by and we believe we are giving the public a greater value. Our success this year is evidence of the prestige the National car enjoys with the motoring public.

### GENERAL MOTORS REPORT.

#### Earnings for the Fiscal Year Exceed All Past Records of the Company.

The annual report of the General Motors Company, Detroit, Mich., shows gross earnings of over \$85,000,000 for the past fiscal year, exceeding all previous records of the company. The net earnings were \$8,184,052, equal to over 50 per cent. on the preferred, or 39.01 per cent. on the common stock, as against 17.4 per cent. in 1912. The statement follows:

|                                    | 1913        | 1912        |
|------------------------------------|-------------|-------------|
| Net profit .....                   | \$8,284,130 | \$4,838,448 |
| General Motors Company's share.... | 8,184,052   | 4,746,756   |
| Accrued interest on notes.....     | 724,581     | 850,563     |
| Balance for dividends.....         | 7,459,471   | 3,896,293   |
| Preferred dividends .....          | 1,048,534   | 1,040,210   |
| Surplus .....                      | 6,410,937   | 2,856,082   |

The profit and loss statement shows the application of surplus earnings above the preferred dividend as follows:

|  |             |
|--|-------------|
| Profit and loss surplus, July 31, 1912.....      | \$1,262,594 |
| Add undivided profits 12 months to July 31, 1913 | 6,410,937   |

|   |             |
|---|-------------|
| Total.....  | \$7,673,532 |
| Reduce inv. assets Oct. 1, 1911, liq. losses..... | 4,728,152   |

Profit and loss surplus, July 31, 1913.....\$2,945,379

In his annual report President C. W. Nash says, in part:

Net profits of \$8,284,139 are after deducting all losses of certain of the subsidiary companies, also all expenses of the parent company, and also after deducting \$1,098,482 for depreciation of buildings and equipment in addition to ordinary maintenance. Subsidiary companies operated at a loss during the year were few in number. The policy will be observed of continuing as going concerns only such of those companies as can be made to yield a profit.

The sole funded debt, July 31, 1913, consisted of \$10,935,000, six per cent. first lien notes, maturing Oct. 1, 1915, being the balance of the original issue of \$15,000,000, dated Oct. 1, 1910. Oct. 1, 1913, the company was required to pay \$2,000,000 to the trustee for account of sinking fund. The company anticipated the payment of \$1,000,000 during July, and since the close of the fiscal year has paid \$1,000,000 additional. The total amount, with interest, was applied by the trustee to the purchase of \$2,022,000 notes, and there are now outstanding \$9,899,000 notes out of the original issue of \$15,000,000.

Aside from these notes, the only other indebtedness consisted of accounts payable of \$4,821,744, and notes payable of \$900,000. The \$900,000 notes payable are the balance of notes of the Weston-Mott Company, issued in connection with the purchase of the 50.2 per cent. of the stock of that company not already owned by General Motors. These notes matured Sept. 15, 1913, and have been paid since the close of the fiscal year.

Further progress has been made in the development of the truck business. The trucks built by this company, both gasoline and electric, are giving general satisfaction and the coming year should show a large increase in volume of sales.



# FEATURES OF FOREIGN LIGHTING DYNAMOS.

Majority of Makers Provide Manually Operated Switch for Cutting Out Generator When Battery Is Fully Charged.

(By C. P. Shattuck.)

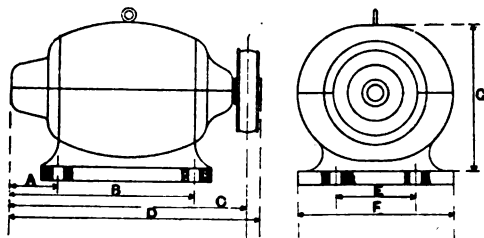
**L**AST fall The Automobile Journal described in detail the construction and operation of the numerous electric lighting systems made in this country and supplemented the serial with a discussion of the C. A. V., a prominent English equipment. It will be remembered that the last named system varied considerably from American equipments, the most marked difference being the device utilized to prevent the battery discharging through the generator.

In the following brief descriptions of some of the best known foreign dynamos, it will be noted

contrast to American methods, but it is explained by the fact that the foreign car maker has not, until very recently, given the mounting of the lighting dynamo consideration, believing that the choice of an equipment is best left to the motorist. There is also considerable difference in the openings or bolt holes and other dimensions which are given in an accompanying table.

There is no doubt that the failure of the manufacturer to make provision for installation by fitting bases or platforms on the power plant, coupled with the fact that lighting equipment is

| Approximate Dimensions of Leading Foreign Lighting Dynamos |               |                        |            |
|--|---------------|------------------------|------------|
| <b>Ducellier.</b>  |               | <b>Lithanode.</b>      |            |
| A 2½ ins.  | B 7 ins.      | A 3½ ins.              | B 5¼ ins.  |
| C 8½ ins.  | D 9½ ins.     | C 9¼ ins.              | D 9½ ins.  |
| E 5 ins.   | F 9 ins.      | E 5¼ ins.              | F 6¼ ins.  |
| G 9 ins.   |               | G 6¼ ins.              |            |
| <b>Lodge.</b>  |               | <b>Brodt.</b>          |            |
| A 4½ ins.  | B 6½ ins.     | A 4 ins.               | B 8 ins.   |
| C 9 11-16 ins.   | D 11½ ins.    | C 10½ ins.             | D 11½ ins. |
| E 2 ins.   | F 4½ ins.     | E 4 ins.               | F 5½ ins.  |
| G 7½ ins.  |               | G 6 7-16 ins.          |            |
| <b>C. A. V.</b>  |               | <b>Lucas.</b>          |            |
| A 3 7-16 ins.  | B 6 7-16 ins. | A 3½ ins.              | B 5¼ ins.  |
| C 9 ins.   | D 10 ins.     | C 7½ ins.              | D 8½ ins.  |
| E 2 ins.   | F 5½ ins.     | E 3 ins.               | F 4¼ ins.  |
| G 6¼ ins.  |               | G 4 7-16 ins.          |            |
| <b>En Route.</b>   |               | <b>Rotax.</b>          |            |
| A 2½ ins.  | B 8½ ins.     | A 3½ ins.              | B 6¼ ins.  |
| C 10 ins.  | D 10½ ins.    | C 9 ins.               | D 10½ ins. |
| E 6¼ ins.  | F 5½ ins.     | E Central              | F 6 ins.   |
| G 4½ ins.  |               | G 6¼ ins.              |            |
| <b>Trier &amp; Martin.</b>                                 |               | <b>Polkey-Jarrott.</b> |            |
| A Varies   | B Varies      | A 7¼ ins.              | B 11¼ ins. |
| C 9½ ins.  | D 10 ins.     | C 12½ ins.             | D 13½ ins. |
| E Varies   | F 5 ins.      | E 3½ ins.              | F 6 ins.   |
| G 6¼ ins.  |               | G 6¼ ins.              |            |
| <b>Peto &amp; Radford.</b>                                 |               |                        |            |
| A Varies   | B Varies      |                        |            |
| C 9 ins.   | D 12½ ins.    |                        |            |
| E Varies   | F 6 ins.      |                        |            |
| G 6 ins.   |               |                        |            |



that in the majority provision is made for cutting out the generator when the cells are fully charged, a manually operated switch being included in the switchboard. This control, differing materially as it does from American practise, is regarded as highly important abroad and is held to be of distinct value, in that overcharging is prevented. The instrument utilized for denoting the condition of the cells is usually of the push button type, providing a reading in tenths, and while not obtaining as fine a reading as by the American practise of using a hydrometer, is sufficiently accurate for practical purposes.

It will be noted that the belt drive is employed exclusively abroad. This is in decided

not standard, but must be purchased by the motorist, has led the majority of motorists to equip their machines with the older forms of illumination. The price of the electric systems is also a factor, and although one small dynamo costs about \$35, the larger generators or well known equipments involve an outlay of \$200 or more, to say nothing of the extra expense of installation.

Reports from abroad would indicate that the manufacturer is cognizant of the demand for electric lighting and provision for fitting a dynamo is made by one well known car maker, a base similar in design to that utilized in this country being fitted to the motor. It would not be at all surprising if the next Olympia show (London)



would see a number of manufacturers making provision for dynamos.

In the majority of foreign lighting systems separate control of each side and headlight is favored, presumably to economize in current when the motor is inoperative, consequently the switchboard is not as neat or compact as those utilized in this country where the tendency is toward a plain dash with compact and convenient grouping of the control units.

About 70 per cent. favor electrical control of the dynamo's output, although one maker offers both electrical and mechanical. The dimensions of the generators are similar to those manufactured in this country, as will be noted by the table above referred to, it containing the approximate measurements of 11 of the largest and latest types.

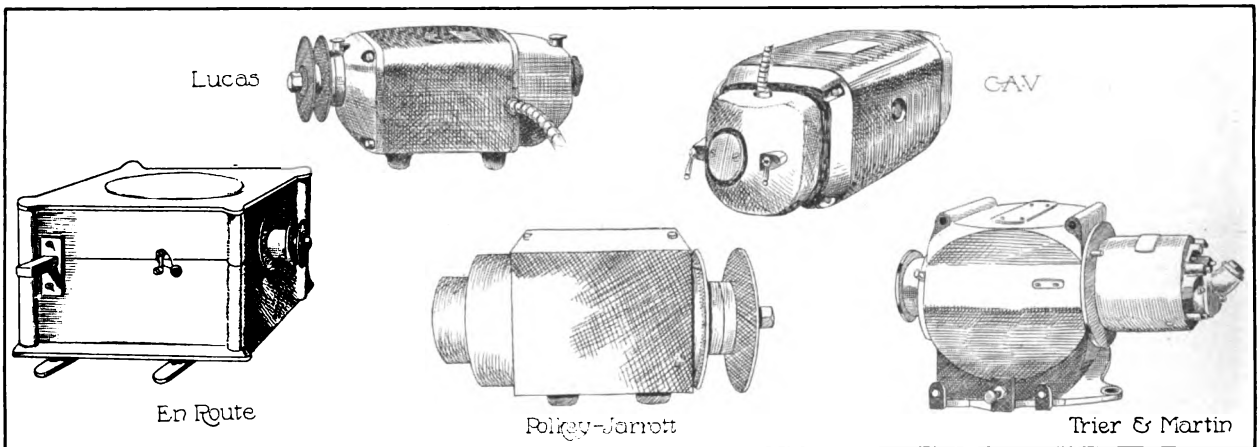
#### Ducellier.

Permanent and electro-magnets are utilized in the Ducellier, and control of the output is obtained by an elec-

tronic contrivance which weakens the magnetic field as the speed of the machine increases. A third brush is utilized on the commutator, it being made adjustable so that the output may be regulated to meet the requirements of each installation, and it is connected to an electro-magnet immediately above the armature, producing a field in opposition to that of the main or permanent magnets. The intensity varies with the speed of the machine, tending to keep the output constant after normal speed has been attained.

The Ducellier resembles the conventional magneto and that appearance is further increased by the use of a metal strap for securing it to a table. The last named member slides in rails, so that the tension of the belt may be adjusted, a screw being fitted for this work. It is noticeable of the design that the same precaution is not taken to protect it from the entrance of dust and other foreign elements as with other types, and it would appear that more or less dirt would find its way to the commutator when the machine is exposed to mud and water. Three switches are provided, similar to those formerly utilized when battery ignition was popular, one controlling the headlights, the second the side and tail lamps, while the third controls the charging of the battery. It is stated that the side and tail lights may be supplied with current direct from the dynamo.

put of the dynamo being held at a proper value by an ingenious use of magnetic actions and reactions which occur between the armature and the field magnets, and it is maintained that the output is kept absolutely constant at all speeds of the car. There are two ordinary poles and two subsidiary poles. The latter are excited by the windings, which are supplied with current from the working mains. The magnetic flux excited from these windings passes, when not distorted, diametrically through the armature from one subsidiary pole to the other subsidiary member and, dividing right and left, finds return paths through the frame of the dynamo. The two ordinary poles have no windings upon them of any kind. Magnetism is excited in them by the reaction of the armature, not that of the whole armature, however, but the reaction due to the current generated in certain short circuited coils; namely, the coils which are for the time short circuited by the brushes that are collecting the current at the commutator. The demagnetizing reactions, increasing with the speed, counteract the tendency of the generated electromotive force to rise as the speed increases, thus the output remains constant. A free wheel is incorporated between the armature spindle and the pulley (belt drive is utilized), so that when the motor is stopped, or run too slowly for the dynamo to develop the proper charging rate, the armature can revolve freely or "motorize," thus over-running the driving pulley. It is held that owing to the design of the machine, only an exceptionally small amount of current is taken from the battery, and that the free wheel device makes it impossible for an excessive current to be dis-



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#### C. A. V.

In the C. A. V. system, which was fully described and illustrated in the issue of The Automobile Journal for Dec. 25, 1912, cut-outs and regulators are eliminated, the out-

charged from the cells through the dynamo. Because of the extremely low speed at which the dynamo generates, the free wheel only comes into action when the engine is actually stopped.

A switch is provided for disconnecting the cells from the generator when the motor is inoperative and should it accidentally be left on, the buzzing of the free wheel is sufficiently audible to attract the driver's attention. The maker points out that the manually operated switch is a distinct benefit in that the dynamo may be cut out when the cells are charged, and that overcharging is thereby prevented under all conditions of service.

Systems utilizing six and 12-volt batteries are produced, the company making a variety of dynamos to meet different installations. The C. A. V. switchboard differs from American conventional practise in that separate switches are provided for the right and left headlights and side lamps. Single members are used for the dynamo and tail light and in one type of board a mechanical charge indicator is utilized in place of the ammeter, also a switch arm on the outside for the lamps. The design also includes a half-output switch and a dynamo emergency member located inside the board. Tumbler type switches are utilized. The C. A. V. company manufactures its own lamps.

#### Brolt.

The Brolt is a bi-polar generator having two small unwound auxiliary poles located at right angles to the main members. In the neutral position relative to the main poles are two brushes, each of sufficient width to short circuit the several coils of the armature, and cur-



rent for charging the storage battery is collected by these brushes in the conventional manner. As the speed of the armature increases, its current creates a flux in the unwound poles, which is cut by the short circuited armature coils. Currents begin to flow therein of a strength proportionate to the speed of rotation, and resulting in demagnetization of the main poles. The maker claims that this method of control reduces sparking to a minimum.

The generator is driven by belt at low speed, about 1.5 times that of the crankshaft of the engine, and the charging of the cells begins at approximately 16 miles an hour car speed. With the large generator the output curve shows about 12 amperes at 1500 revolutions a minute, and there is no further increase up to 4000 revolutions, although the chart shows a rapid rise after the cutting in of the generator.

The switchboard is a neat aluminum case, black finished, and the cut-out is enclosed in this unit. Located in the centre of the board is an ammeter showing permanently the charging rate, and the same needle gives voltage upon pressing a button. The control switch is of the rotating type, the circuit being denoted by the appearance of words behind a glass panel such as "charging," "head," etc. Beside the voltmeter is another window, enclosed by a red glass, lighted by a small lamp in series with the tail light.

#### Lodge.

Compactness and simplicity are noticeable in the Lodge generator, which is of the permanent magnet type, belt driven, and it is designed to be operated at high

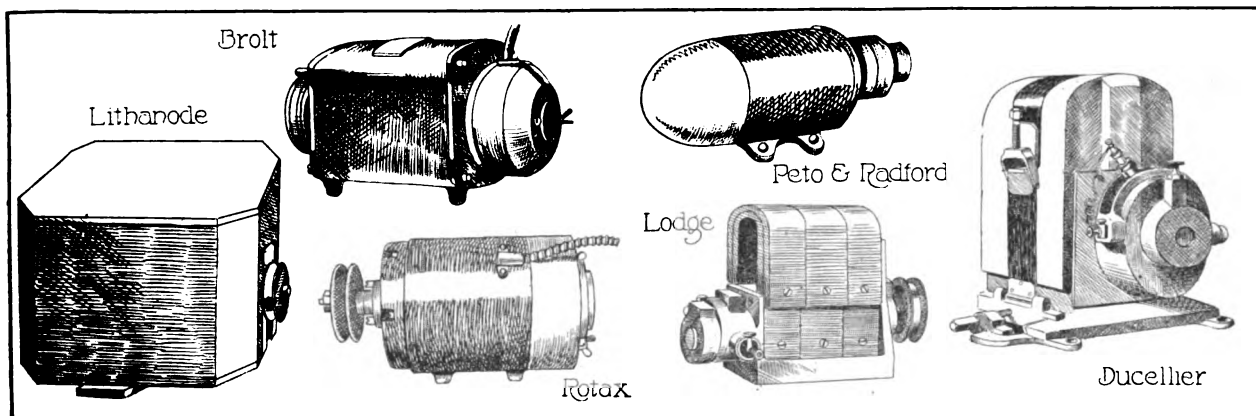
containing the armature, cut-out, etc., is made in two sections and is sealed, an arrangement preventing tampering and avoiding disputes between the maker and owner in the event of trouble.

It is held that the output of the dynamo at high ratios does not overcharge the cells. It is presumed that the charging rate is such that in average service the cells would be properly maintained, but it would appear that they would be subject to overcharging if the car were to be used but little at night and driven considerably in the day time. The only switches employed with the system are the lighting members, meters being eliminated.

#### Lithanode.

A simple form of bi-polar generator is noted in the Lithanode, with which the output is allowed to increase with the speed of the instrument, no subsidiary windings or opposing currents being utilized. The method employed to prevent an excess current damaging the lamps is novel, it being accomplished by the resistance of nickel wire. This material is held to possess the characteristic that its resistance increases enormously at and above a certain critical temperature and unlike iron, which has the same feature, is not liable to oxidation through moisture or heat. By suitably proportioning the length and dimension of the wire, which is incorporated between the generator and the dynamo, the current is held to a predetermined value, and any above a certain amount merely heats the wire.

A centrifugally operated switch is utilized to break the circuit when the dynamo is inoperative, two miniature chopper switches being actuated by two small arms on



speed, as the maker claims the tunnel wound armature may be rotated as high as 8000 revolutions a minute without injury. It is also held that a large output is obtained with a pressure of six volts, enabling the use of thick lamp filaments of any desired candlepower. Four brushes are employed, these being located side by side in pairs, the object being to provide an extremely large contact.

One of the features of the design is the use of top and bottom lubricators so that oil may be supplied to the bearings whichever way up the dynamo may be fitted. The battery is prevented from discharging through the generator by a large compound cut-out located in the switchboard, and a second device is incorporated in the pulley, which buzzes if the charging switch is not thrown off when the engine is stopped. Switches of the push and pull type are utilized, and instead of the push button meter, instruments of the moving coil type are utilized. These are similar to those employed with American lighting systems, the indicating needle denoting charging and discharging rates. Instead of a dash tell tale for denoting breakage of the tail light filament, a buzzer is employed.

#### En Route.

The En Route is designed chiefly for light cars and with this system the battery is floated upon the line; that is, all current utilized is drawn from the cells, which are continuously charged by the generator. This makes for simplicity, as but two wires lead from the dynamo to the battery. The cut-out is of the automatic magnetic type, is embodied in the dynamo and comes into action when the motor is stopped or when the value of the current generated is below that of the cells. The casing

the armature, which members move outward, due to centrifugal force. The usual dash equipment is provided, but the head and side lights are separately controlled. Damage to the dynamo in case it is run on an open circuit, is prevented by a fuse.

#### Peto & Radford.

The system produced by Peto & Radford resembles in some of its details that of a well known American make in that a mechanical governor, a clutch operated by centrifugal force, is utilized. A double disc is employed, an arrangement that should be less susceptible to differences of engagement through wear. End thrust is also eliminated from the armature as the pressure holding the two moving discs to the rigid part of the shaft is obtained by a central spring exerting a force in each direction. The thrust due to the spring is practically self-contained in the clutch.

To prevent the battery discharging through the dynamo, a magnetic cut-out is utilized. Although designed to be driven by a belt, friction contact with the flywheel is optional. Separate control of the lamps is provided.

#### Lucas.

The maker of the Lucas dynamo has introduced a new generator, the output of which is electrically controlled, although a mechanically governed generator is marketed. The last named includes a cone clutch controlled by a form of centrifugal governor. Regulation is accomplished in the new design by a third brush located between the two main members, and it is employed to collect current from the armature, using it to intensify or reduce the strength of the field magnets. The dynamo is operated at a speed slightly higher than that of the en-



gine, about 1500 revolutions a minute with the car travelling at 20 miles an hour.

Three switches are employed, two for controlling the lamps, while the third member is for charging. The switchboard is sealed and provision is made for plugging in an inspection light. The battery used with the system differs from conventional practise in that instead of plates being flat, they are curved, it being held that the design not only prevents buckling and disintegration, but a very high discharge rate is possible.

#### **Rotax.**

The Rotax is an adaptation of the Leitner system utilized in railway lighting, the principle being that of damping the fields by means of current drawn by a pair of brushes. As increase in armature speed distorts the field, the voltage between the subsidiary brushes is first reduced, then reversed; that is, at slow speeds the current drawn by the brushes aids in the excitation of the fields, at normal is inoperative, and at high ratios is in opposition to the main field windings. The coils are proportioned to obtain a steady curve of output.

A magnetic switch is employed to connect the generator with the battery when the proper charging current is developed. Compound winding is utilized and it is held that the action is positive in either direction. That is to say, when the dynamo develops a current in excess of that of the battery, a connection is made, but should the contacts stick or fail to break for any reason, when the output of the generator falls, the reversal in the direction of the current in the cut-out coils breaks the circuit magnetically. A volt-ammeter is included, also option of a multiple switch or individual units. Fuses are employed in each lighting circuit.

#### **Polkey-Jarrott.**

In the Polkey-Jarrott system a centrifugal governor is utilized, but it is employed somewhat differently than in standard types of dynamos, it preventing the discharge of the cells through the armature when the dynamo is not developing sufficient current to overcome the resistance of the battery. The output of the generator is controlled electrically, a third brush collecting current which is utilized to regulate the strength of the magnetic field, and it is claimed for this system that instead of increase causing greater heating it actually runs cooler at high ratios. A charging switch is included with other members and the ammeter is illuminated at night by a small lamp in series with the tail light.

#### **Trier & Martin.**

Choice is given with the Trier & Martin of an electrical or a purely mechanical cut-out. A small flywheel on the armature shaft rotates in mercury contained in a shallow trough; throws the liquid tangentially up the side of the bath, the height attained being dependent on the speed of the wheel, and contact is made between the dynamo and battery only when a predetermined speed has been reached, the mercury touching a contact device.

The dynamo is of the shunt wound type, having four brushes equally spaced around the commutator. Two are positioned as usual, and to them are connected, through suitable resistance, one each of the other brushes. Excitation of the field magnets is by the main brushes, the auxiliary members and their resistance being employed to control the output, which is automatically regulated and within a wide range of speed.

The operation is as follows: Upon the armature beginning to revolve residual magnetism causes a small current to flow around the windings of the field magnets, building up the shunt field, and, since each main brush is connected to an auxiliary member through a resistance, current will also flow through it, also the conductors of the armature lying between the connected brushes, producing a magnetic flux in the armature parallel to a line connecting a main and auxiliary brush, tending to strengthen the main field.

Increase of speed up to a certain point results in no other effect than an increase in the magnitude of the forces, the point being when the speed is high enough to generate the line voltage between the main brushes, and represents the cutting-in speed of the machine. Additional speed produces an armature reaction which displaces the axis of the field forward and has the effect of reducing the current in the resistances between the main and auxiliary brushes. This continues until the axis of the field is displaced by 45 degrees, when no electricity will flow, as both main and auxiliary brushes will be at equal potentials. With further increase in displacement

of the axis of the field, current will again begin to flow between the main and auxiliary brushes, but in the reverse direction, weakening the field and making the dynamo self-regulating. The current flowing in the resistances is in the same direction as the main, so that at high speed the auxiliary brushes supply part of the main current and by suitable design can be made to carry half of the entire load.

The maker states that the rise in temperature at full load is small, owing to the armature coils between the main and auxiliary brushes being practically idle. The dynamo is attached to a small platform, upon which it slides, and adjustment of position is by means of a screw member. The platform may be fitted to either the top or bottom of the generator. Control of the lights and charging is by rotary switches. A combined volt-ammeter is fitted.

## **INTERNATIONAL SWEEPSTAKES.**

### **Entry List Now Open for Fourth 500-Mile Event on Indianapolis Speedway.**

Although the entry list for the third annual international sweepstake 500-mile race on the Indianapolis motor speedway was not opened until Jan. 1, 1913, the management has decided it is best to give manufacturers and individuals a longer time in which to make up their minds concerning the fourth event, which will be held Memorial Day, 1914. Entry blanks already have been sent out and the list will close May 1.

There have been several changes in the conditions governing the coming race. The entry fee has been reduced from \$500 to \$200, with the further stipulation that 50 per cent. of this fee will be refunded to all cars that start May 30. In order to insure the safety of drivers it has been ordained that all steering knuckles and tierods must be new two days before the starting of the race, while aluminum steering wheels will not be permitted. The frame hangers and steering mechanism shall be subject to the approval of the speedway's mechanical engineer, and cars failing to meet this approval will not be permitted to start. All drivers, including relief drivers, must furnish the referee with a certificate from the speedway surgeon, Dr. H. R. Allen, proving they are physically fit to engage in such a contest, and that they are entirely free from any serious nervous manifestations or other disorders which might prove a handicap.

The regular prizes will be the same as those of this year. A purse of \$50,000 will be offered, this being divided into 10 prizes, starting with \$20,000 for the winner. The Wheeler-Schebler cup will go to the entrant of the car which is first at 400 miles; the Prest-O-Lite trophy to the car in that position at 300 miles, and the Remy grand trophy to the machine which is first at 200 miles. The race is limited to cars the piston displacement of which does not exceed 450 cubic inches, and with a minimum weight of 1600 pounds.



## WITH THE CYCLECAR MANUFACTURERS.

### Constructional Details of Imp Two-Cylinder Roadster, Utilizing Specially Designed Friction Transmission---Features of the Little Princess.

**A**S PREVIOUSLY suggested in these columns, it is proving a difficult matter to differentiate between those machines which are described as cyclecars by their makers and those small cars which conform in many of their details to those which are classified as cyclecars but which their makers do not care to have termed thus. And in the absence of a definition which can be made to apply, it must suffice to state that there appears to be every evidence that the season of 1914 will witness the production of a large number of small cars selling at less than \$500. Most of these will be known as cyclecars, regardless of the term utilized by the maker.

While new cyclecar companies are being announced weekly, few of these concerns are as yet in a position to supply detailed information as to their product. Several have experimental machines on the road and changes in construction are being made as fast as the need for them is made apparent. Many of these concerns give no promise of being able to fill orders until next spring. The Automobile Journal hopes to present in this department constructional details and other information as early as it can be secured from the makers. It will be understood that, in some instances, further experimentation may disclose the need for additional changes and these will be presented in a similar manner.

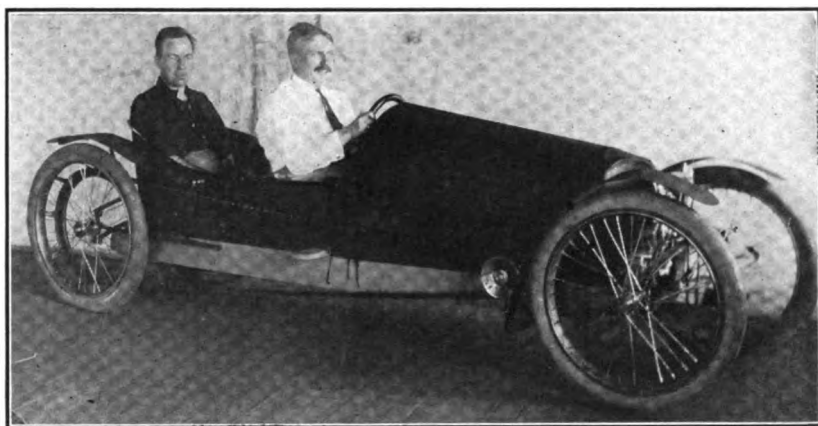
#### THE IMP CYCLECAR.

The Imp Cycle Car Company, Auburn, Ind., appears to be closely related to the W. H. McIntyre Company, a concern which has been in the vehicle manufacturing business for 44 years, and which has experienced success in the production of both pleasure cars and motor business wagons. Experimentation in the cyclecar field has been under way for the past year and a half, and for some time one of these machines has been on the road. The company already has begun to make

deliveries on orders, and several agencies have been established. The cars are made in the McIntyre factory.

The Imp cyclecar follows rather closely the accepted design of this type utilized in France. The two-cylinder motor drives through a friction transmission and belt to the rear wheels, no differential being utilized. The machine seats two passengers, arranged in tandem. The wheelbase is 100 inches and the tread 36. The ground clearance is eight inches. The weight of the machine is 550 pounds, and the maximum speed 50 miles an hour. It is stated by the manufacturer that tests indicate that it will cover 50 miles on a gallon of gasoline.

The motor is a two-cylinder, air-cooled unit,

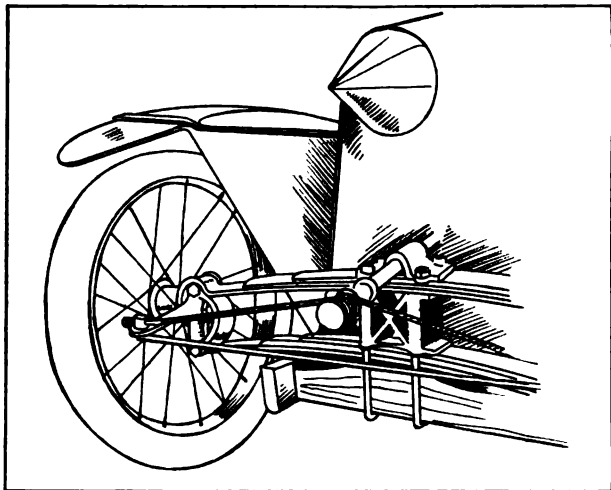


**Imp Cyclecar, Presenting the Seating Arrangement and the Main Constructional Features.**

with cylinders set at an angle of 45 degrees, rated at 10 horsepower at 1500 revolutions a minute and 15 at 2500. The inlet valves are mechanically operated. Cooling is accomplished with fins cast close together on the cylinders and exhaust connections. The cylinders both face the front of the car and the hood is so constructed as to permit air to be deflected around back of them. The carburetor is of the standard float type with compensating air valve, and the magneto a high-tension instrument. A piston pump is used to circulate oil through the engine. No cut-out is fitted.

The engine is started by turning a detachable crank inserted in the centre of the steering wheel. This crank connects with a shaft through the





Front Spring and Steering Arrangement on the Imp.

steering column, which communicates with a ratchet on the crankshaft by means of 3-1 bevel gears, spinning the motor three times faster than turned by hand. Compression in the motor is released automatically when the crank is inserted and applied as soon as the turning ceases, so that the operator does not turn the motor against compression.

The transmission affords four forward speeds and reverse. It is of the friction type. A special alloy disc is attached to the crankshaft, while the sliding member, or follower as it is termed, has a detachable paper friction ring clamped between two metal flanges. A lever fulcrumed about 1.25 inches above the centre line of the motor shaft operates against a trunnion housing which contains Radio thrust bearings. Two springs anchored on a flexible arm on the motor are attached to the upper end of this lever, which is controlled by pedal, and the spring tension is increased or diminished by a cam mounted on a shifting rod and pressing against a corresponding cam on the flexible arm, while the follower is moved across the motor disc. This action decreases the pressure between the friction wheels as the speed of the follower increases in an inverse proportion exactly, or vice versa, assuming that the motor is running at a fixed speed. Each speed is locked when set by the device connecting the shifting rod with the pedal.

In operating this mechanism, it is necessary only to press down the pedal which is connected with the lever, re-

leasing the friction surfaces, and set the speeds the same as in the sliding gear construction. A lever on the dash controls the cross movement of the friction follower and at the same time sets the springs for the proper tension. An arced plate on the dash registers the speed engaged.

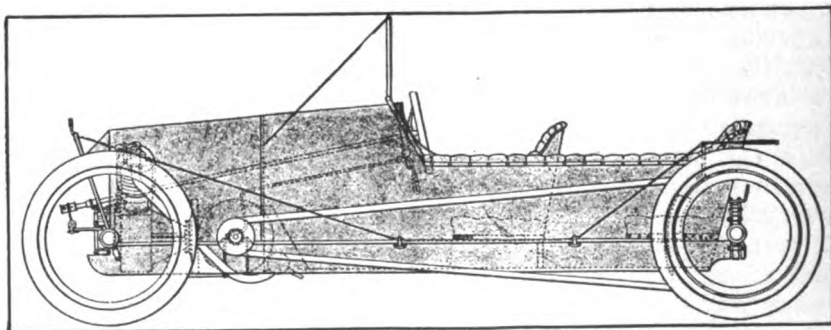
Final drive is by a 1.125-inch V belt to the rear wheels. No axles are fitted, except, of course, the stub axles on which the wheels turn. Instead two flat springs are set crosswise of the frame and fastened at the ends to yokes, between which the wheel spindle is fitted; in front, to a pivoted steering knuckle, and in the rear, to a rigid arm. It is pointed out that as a result of this construction the only unsprung weight is the wheel weight. A hard wood V block attached to a lever on the radius rods and controlled by a pedal, is pressed into the rear pulley grooves, to act as a brake.

Steering is accomplished by a steering wheel in the centre of the car, the post running to the front and ending in a bobbin, around which run steel cables to the steering arms of the front knuckles, a spring keeping them taut as shown. A tierod across the front connects the arms.

Wire wheels are used with the spokes strung tangent. The rear pulley is riveted direct to the rim. Hubs have adjustable self-contained ball bearings. The tires are 28 by 2.5-inch clincher members, front and rear. There is space at the rear for tools, etc., and luggage. The standard equipment includes the starter, lamps and horn.

### THE LITTLE PRINCESS.

The Princess Cyclecar Company was organized recently in Detroit, with capital of \$200,000. The organizers include I. N. White, with 12 years of corporation financial experience; H. H. Dawson, expert cost accountant; C. J. Thornehill, for three years with the Wolseley and Sideley com-



Skeleton Side View of the Imp Model, Showing the Detailed Arrangement of the Components.



panies in England and formerly manager of Thornewill Bros., a British motor engineering concern; J. A. Martin, formerly draftsman and designer with the Oakland, Wagner electric and Chandler cars; E. H. Vincent, designer and engineer with 10 years experience with the Packard, Regal, Hudson and Cartercar machines, and H. L. Blydenburgh, formerly a designer and engineer with the Buick, Packard and Lozier companies. Temporary quarters have been secured in suite 1311, Dime Bank building, Detroit.

The company plans to manufacture three models, the Little Princess, a two-passenger roadster; a four-passenger touring car, and a light merchant's parcel car. All will utilize the same chassis. At present little more can be stated concerning the product than a recital of its specifications, although additional information is expected shortly.

The motor is a four-cylinder, four-cycle, air-cooled, L head unit, with bore of 2.75 inches and stroke of 3.675. The company maintains that it gives an actual horsepower of 12. The bearings are a high grade of nickel babbitt, and the crankshaft and connecting rods of drop forged high carbon steel. The one-piece camshaft is hardened and ground. Valves are large and of the mushroom type. The magneto is a high-tension Bosch, and the carburetor a Holley. Lubrication is by positive circulation. The engine starts from the dash.

The transmission is a planetary type, affording two speeds forward and reverse. The rear axle is of the bevel differential type and the front, tubular. Two sets of brakes are fitted. Springs are semi-elliptic in front and semi-transverse in the rear. The frame is channel section, strong and light.

The body is of metal and affords plenty of leg room. The passengers are seated side by side, the driver at the left. Bedford cord or leather upholstery and deep cushions make for comfort. The hood is of the sloping French type. Room for luggage is provided in the rear. The gasoline tank is under the dash and its capacity is five gallons.

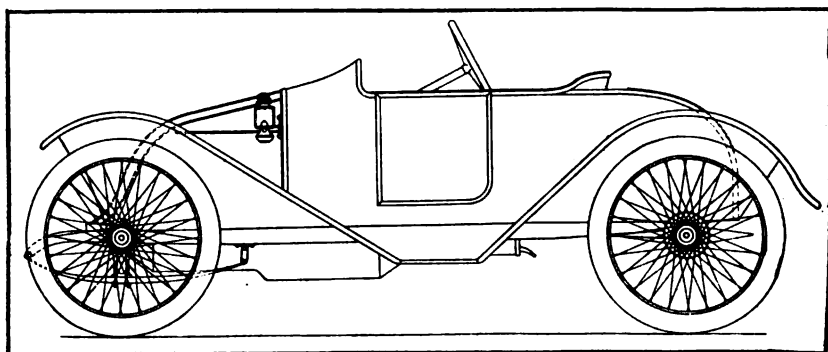
Wire wheels are fitted, these being equipped with 28 by three-inch tires. The wheelbase is 86 inches, and the tread, 44. The weight is 600 pounds. The maker claims a fuel consumption of 40 miles to the gallon.

#### WANTS LIST OF MAKERS.

Will you kindly publish a list of American cyclecar makers?  
A SUBSCRIBER.  
Pittsburg, Penn., Oct. 1.

New cyclecar companies are being incorporated very rapidly, several of these being presented under the heads of New Incorporations each issue, but the following were organized previous to Oct. 1:

American Cyclecar Company, Equity building, Detroit; American Voiturette Company, Detroit; Blood Bros., Kalamazoo, Mich.; California Cyclecar Company, 818 South Main street, Los Angeles, Cal.; Continental Engine & Manufacturing Company, Minneapolis, Minn.; Davis Cyclecar Company, Detroit; De Cross CyCar Company, Galloway street, Cincinnati, O.; Detroit Cyclecar Company, 510 Free Press building, Detroit; Downing-Detroit Cycle Car Company, Detroit; Economycar Company, Indianapolis, Ind.; Falcon Cyclecar Company, Cleveland, O.; Fenton Engineering Company, Fenton, Mich.; Imp Cycle Car Company, Auburn, Ind.; Princess Cycle Car Company, 1311 Dime Bank building, Detroit; Ritz Cyclecar Company, 54 Wall street, New York City; Saxon Motor Car Company, 2609 East Jefferson avenue, Detroit; Twombly Motors Company, 258 West 69th street, New York City; Victor Motor Car Company, 371 Diamond street, Philadelphia; Zin Cyclecar Company, Rock Island, Ill.



Side View, Indicating General Design and Appearance of Princess Roadster.

The Woods Mobilette Company, Chicago, maker of the Woods Mobilette, described fully in the last issue of The Automobile Journal, states that the cyclecar it is now prepared to deliver will be equipped with a four-cylinder, 14 horsepower motor, instead of the two-cylinder, 10 horsepower engine utilized in the first machines produced.

The Importers' Automobile Salon, New York City, has decided to hold its annual display of foreign made cars in the Hotel Astor, Jan. 2-10, 1914. The date coincides with the showing of pleasure vehicles to be held by the Automobile Chamber of Commerce in the Grand Central Palace. The association has elected the following officers for the ensuing year: President, E. Lascaris, representing the De Dion-Bouton; vice president, T. Adams, Lancia; treasurer, F. Sewell, Minerva; secretary and show manager, Stefan Kjeldsen, Mercedes.

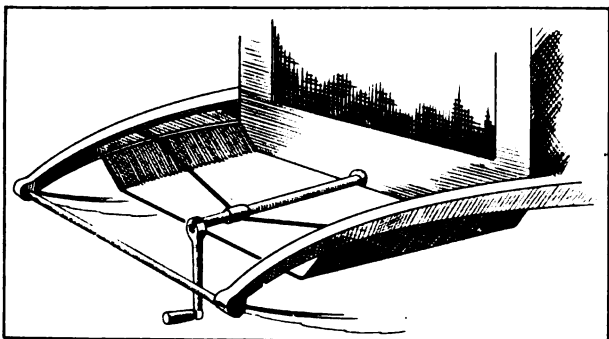


## MECHANICAL NOTES FOR OWNERS.

### Fitting a Shield to Protect Radiator--Method of Repairing Broken H Gate---Spark Plug Terminal Hint---Care of Rims--Packing Water Pumps.

**M**ANUFACTURERS of radiators lay great emphasis upon keeping the cooler clean and free from deposits of mud, dirt, etc., stating that the efficiency of these members is greatly reduced when their exterior is covered with foreign elements. It is not uncommon to note a machine with the radiator encrusted with dried mud, and sometimes after washing particles of dirt remain. The following contribution was received from a reader who states that he experienced considerable trouble from the motor overheating, and that by fitting a shield or pan, the radiator was not only kept clean, but the device improved the cooling system:

I am forwarding a rough sketch of a shield I fitted to my car, which is an old model, and perhaps the hint may be of service to some other motorist who is experiencing heating caused by an old radiator. The cooler is an old type and the fins are such that they fill easily with dirt, especially when it is muddy. I devised a shield or pan,



**Suggestion of Reader for Fitting Shield to Prevent Mud Splashing on Radiator, Which Is Stated to Improve Cooling by Deflecting Air Currents.**

which I made of enamelled leather, and fitted it as shown in the drawing. I secured the sides to the goose neck or frame extension and the back I bolted to the radiator hanger, the design making it a simple matter to attach. I found after trying the shield out that it had a tendency to blow upward, so this led to my making a rod, sewing the leather to it at the front and bolting the rod to the frame. I constructed this so that the shield was slightly lower at front and I believe that it deflects the wind onto the bottom part of the radiator. Anyhow, I am having better luck, as the motor does not heat as badly as formerly. Of course, the shield could not be fitted to every car as the starting crank might be in the way.

#### SPARK PLUG HINT.

The average owner when on a trip wears gloves when driving, and in the event of having to do some work, such as a minor adjustment, dislikes to remove the gloves, as water and soap are not always available for cleaning. The majority

of experienced motorists have, at some time or other, experienced the annoyance of dropping the terminal of a spark plug when replacing the plug or fitting a new one, and invariably the terminal will drop into the pan where it is not easily recovered. It is not an easy matter to catch the fine thread, especially with gloves on, although some makers of plugs recess the terminal so that it will start easily.

In an accompanying illustration is shown a simple method of making the threaded member "drop proof" by filing away two or three of the threads. The terminal will then slip on and catching the thread will be a simple matter. It requires but a few minutes to file the centre electrode, as shown in the drawing, and the hint will be appreciated if one has to change a plug on a day when the hands are benumbed by the cold.

#### REPAIRING JACK.

Many times jacks are discarded as worthless when a little work would make them as good as new. An instance of a high grade jack being thrown away by an owner because it did not operate properly, the head part continually sliding out when in the tool box and requiring much patience to replace it, was noted recently.

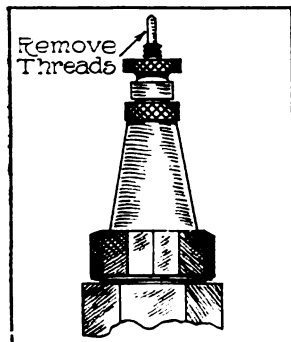
The motorist gave it to the garage attendant, who in a few minutes had it operating as well as ever. The side cover of the jack was removed and a pin fitted in the part that gave the trouble, a task that could have been performed by its owner had he been familiar with its construction. The pin is used to retain the sliding part, and sometimes these become bent through subjecting the jack to undue leverage. Sometimes the slipping or failure of the teeth to catch when raising the car is due to a loose screw. The mechanism of jacks is simple and aside from a broken part may be adjusted easily.

#### REPAIRING H GATE.

Careless operation or faulty material may be responsible for a broken section of the H gate, that member in which the speed change lever is moved. Sometimes the corners of the slots become badly worn, and bother the driver in making changes. An instances of a broken gate came



to the attention of the writer recently and the manner in which a repair was effected will be of service to those who may experience similar trouble. The material broke in making a change from high to second, a piece being detached and leaving the quadrant similar to that depicted at A in an accompanying illustration. The break is purposely exaggerated to explain the repair. As a new part would involve considerable expense the owner attempted to repair the member.



Spark Plug Hint.

He obtained a piece of hard brass .1875 inch thick and of suitable proportions, and fitted it to the gate as shown at B. Holes were drilled as outlined at C, the plate clamped onto the gate, and the gate proper marked. The plate was next removed and holes drilled and tapped in the gate member. By using flat headed machine screws, and countersinking these, the plate was not only held securely, but the job presented a neat appearance. The plate was smoothed up before the final fitting and care was exercised to be sure that it aligned with the part to which it was secured.

### GRAPHITE THE RIMS.

Although suggestions for cleaning and graphiting the rims have been made in these columns, there are many new owners who do not realize the importance of keeping the rims in first class condition. With the extra size tires being fitted, it naturally follows that blow-outs are not so common as formerly when the shoes were overloaded. While no one likes to change a casing until obliged to, the work will be made considerably easier if the rims are maintained in proper condition.

With the approach of fall weather with its rains, it is a good plan to remove the shoes, clean and graphite the rims or use a preparation containing this material. Mix oil and powdered graphite together, making a very thick paste. Next clean the rims, smoothing up any rough places that may exist, and apply the graphite freely. Rub off with a cloth, which will impart a bright finish, leaving a surface that will resist the action of water or moisture, and which will make changing tires an easy matter.

### CAUSE OF OVERHEATING.

An owner who possesses an old time car, which in spite of its age gives good service, was bothered one cool day by his engine becoming hot and the water in the radiator boiling. An examination showed that the cooler was filled and that there was plenty of oil in the crankcase. The pump shaft also rotated when the engine was turned over.

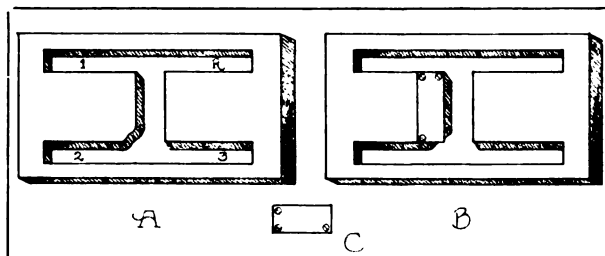
Deciding that the trouble must be in the pump, the owner disassembled this member and found that one of the gears was slipping on the shaft, the pin having become sheared off. Not having a drill to remove the broken pin, or a new pin, a repair was effected by roughening the surface of the shaft with a cold chisel, making a driving fit for the gear, which when replaced, held, enabling the journey to be completed.

### PACKING WATER PUMPS.

In renewing the packing in water pumps care should be taken to wind the material in the same direction that the shaft rotates. When candle wicking is utilized it is a good plan to soak it in a mixture of oil and powdered graphite, utilizing plenty of the latter. In adjusting the binding nut, do not set it up too tightly. It is best to operate the car for a day or so, then readjust the packing, as by this treatment there will be less danger of cutting the shaft.

### SOFTENING HARD WIRE.

If caught on the road without other than hard wire, and a piece of flexible material is needed, this may be made pliable by heating or annealing



Method of Repairing Broken Part of Speed Change Gate: A, the Broken Corner; B, Plate in Place; C, Plate Drilled for Fitting.

it in the flame of the headlights. The wire should be held with a pair of pliers to prevent the heat being communicated to the fingers.



## WITH THE MOTORING INTERESTS ABROAD.

### Two British Car Manufacturers Designing Alcohol Burning Engines—Peugeot Wins French Light Car Race—Interesting Motor Agricultural Implements.

**S**INCE Great Britain appears to be dependent upon outside sources for motor fuel, regardless of whether it uses gasoline, kerosene or benzol, it perhaps is not surprising to note that at least two British car manufacturers have commissioned engineers to design alcohol burning motors. This information was contained in a recent issue of the Commercial Motor, a British publication, but the statement did not include the names of the makers in question.

The subject is one which has been given attention by British automobile engineers for the past seven or eight years, largely because of the possibility of securing the desired fuel at home. Investigations and experiments were carried on previous to that time in an effort to learn the exact

in many respects a repetition of the Grand Prix, July 12. Georges Boillot in a Peugeot was the winner in both events, while his teammate, Jules Goux, was second. A Sunbeam was third in both instances, Chassagne being at the wheel in the Grand Prix, and Lee Guinness in the small car event. The Grand Prix covered 569 miles, while last month's race was for 387 miles. The latter contest was limited to cars of 183 cubic inches piston displacement.

Two American cars, Buicks, were entered in the small car event. These and two Sunbeams, one driven by Chassagne, and a Vauxhall withdrew before the completion of the race. The Vauxhall went out during the last round of the course, which measured about 32 miles. The following table gives the final results:

| Car        | Driver   | Time    | M.P.H. |
|------------|----------|---------|--------|
| Peugeot    | Boillot  | 6:07:04 | 63.2   |
| Peugeot    | Goux     | 6:16:03 | 61.7   |
| Sunbeam    | Guinness | 6:18:05 | 61.4   |
| Vauxhall   | Hancock  | 6:58:18 | 55.3   |
| Peugeot    | Rigal    | 6:59:44 | 55.2   |
| Alda       | Tabuteau | 7:52:34 | 49.0   |
| Anasagasti | Avary    | 8:07:25 | 47.0   |

#### FOR THE SMALL FARM.

#### Some Interesting New Agricultural Motors Brought Out Recently in France.

Eugene Bauche et Cie, Le Chesnay, France, displayed three new agricultural motors at the recent international exhibition in Soissons, which will prove of interest to motorists generally, because of the fact that each is designed to take the place of a single horse on the small farm. Two of these are hoeing machines and the third a mower.

The larger hoeing machine is propelled by a single-cylinder, four horse-power motor, driving the two main wheels in front. The engine is air-cooled by means of a rapidly rotating fan, so encased as to deflect the currents of air around the cylinder. The final transmission is by means of pinions and internally cut gear rings, and the whole of the transmission mechanism is encased and protected from dust and dirt. The rear of the machine is carried on a single trailing wheel, and between this and the engine are two transverse shafts, to which are attached the four hoes.



**Bauche Mowing Machine, Utilizing Single-Cylinder Motor.**

results to be obtained from its use. The increasing price of gasoline has had its effect in bringing about the present situation, and it would appear from such information as is obtainable on this side that the motoring public in Great Britain is demanding that the industry shall give the subject still more serious consideration.

#### PEUGEOT WINS AGAIN.

#### Boillot and Goux Finish First and Second in Small Car Race in France.

The running of the so-called French small car race over the Boulogne circuit, Sept. 22, was



By means of an eccentric and rod these are given a reciprocating or striking action when the machine is in motion. The smaller hoeing machine is similar in every respect, with the exception that its engine develops but 2.75 horsepower.

The Bauche mower has a single-cylinder motor rated at three horsepower, placed with its crankshaft parallel to the main axle. The drive is taken by means of spur gearing to a shaft on the right of the engine and carrying the clutch, which when engaged transmits the power to the right hand main wheel by spur gearing. By means of other spur gearing the left hand wheel is made to drive a pair of bevels which rotate shafts leading forward and terminating with a disc and crankpin, to which a rod is connected and made to actuate the usual form of cutter bar arranged at the extreme right of the vehicle. This cutter bar is hinged so that it may be elevated to a vertical position when not in use. The machine is guided by a pole at the rear, fitted with two handles, between which is fixed a hand lever for operating the clutch. In front a simple form of mechanism permits the cutter bar to be raised or lowered as required.

Shown in connection with the Bauche machines was a potato planter, and while definite information is lacking as to the motive power for this, it is assumed that provision is made for attaching this to one of the other vehicles. The operator of the planter has a seat at the rear, handles in front to guide the machine and a lever at the right to actuate the mechanism arranged to drop the potatoes at stated intervals. Directly in front of the distributing tube is a plowshare, which digs the necessary drill, and immediately behind the tube are two hoes, so arranged that the potato is covered automatically.

#### NEWS FROM FOREIGN LANDS.

A cablegram from London, dated Oct. 1, states that a 30 horsepower car (name not given) covered 1078 miles,

460 yards, on the Brooklands track in 12 hours, creating a new world's record.

The African World is authority for the statement that motor cars and motorcycles are being imported in increasing quantities into Nyassaland, the value for the last financial year being about \$60,000.

John L. Poole, resident export manager of the Hupp Motor Car Company in Paris, asserts that the United States will export 50,000 motor cars during 1914, and that 75 per cent. of these will be produced in Detroit.

The chamber of commerce at Oppeln, Germany, reports that the annual production of benzol at present is between 150,000 and 180,000 tons, and that this is to be increased very materially by the construction of a large number of coke ovens.

According to a correspondent for the Autocar, a British motoring print, a motorist in Liverpool recently was somewhat mystified because his engine refused to start, although a superficial investigation, with one side of the hood raised, failed to reveal any defect. Upon cranking the machine he was startled to hear a plaintive cry, apparently from the interior of the engine, something to which he was not accustomed, although it is explained that the machine was a Singer. Further investigation,



The Larger Bauche Hoeing Machine and a New Automatic Potato Planter.

the other side of the hood being lifted, discovered a kitten seated on the magneto in such manner as to establish a short circuit. The correspondent fails to offer an explanation as to how the kitten found its way to this unusual position.

The Swiss government bureau of statistics announces that at the beginning of the present year there were 4665 privately owned motor cars in Switzerland, of which 1629 were of Swiss construction. Of the remainder, 1550 were French, representing 26 different makes; 476 German, 11 makes; 282 Italian, five makes; 100 Belgian, two makes; 62 American, two makes; 11 British, one make. This leaves 555 cars the maker of which appears to be unknown.

According to the report of Consul George H. Pickerell, stationed at Para, Brazil, the present low price of rubber is tending to restrict shipments from the Amazon valley, many producers refusing to send down their supplies. Shipments through the ports of Para, Manaos, Iquitos and Itacoatiara to the United States and Europe during the month of July (the first month of the 1913-14 rubber season) amounted to only 4,189,454 pounds, in contrast to a total of 5,627,602 for the corresponding month in 1912.



## DETAILS OF VULCAN "27" TOURING CAR.

**S**UPPLEMENTING the announcement of its speedster model, the Vulcan Manufacturing Company, Painesville, O., presents particulars of its five-passenger touring car which sells for \$100 more than the first named machine. With the exception of the wheelbase, which is 115 inches, and heavier springs and parts caring for the added weight, the chassis is practically the same for both. The lines of the new model are extremely graceful and its appearance is further enhanced by clean running boards.

The motor is of the four-cylinder, L head type, with the cylinders cast en bloc, and has a bore of 3.375 inches and stroke of five. The rating of 27 horsepower is said to be very conservative. Throughout the proportion of components is liberal, the bearings, crankshaft and camshaft

transmission is of the selective type, providing the three conventional forward speeds and a reverse, with direct drive on the third. The gears and shafts are large, carefully cut and heat treated with the engaging gears chamfered to provide easy and quiet engagement. The change speed lever is set in a ball and socket below which is the H cast in the transmission housing, and the lever is of the cane handle type surmounted by an aluminum ball conforming to the shape of the palm of the hand.

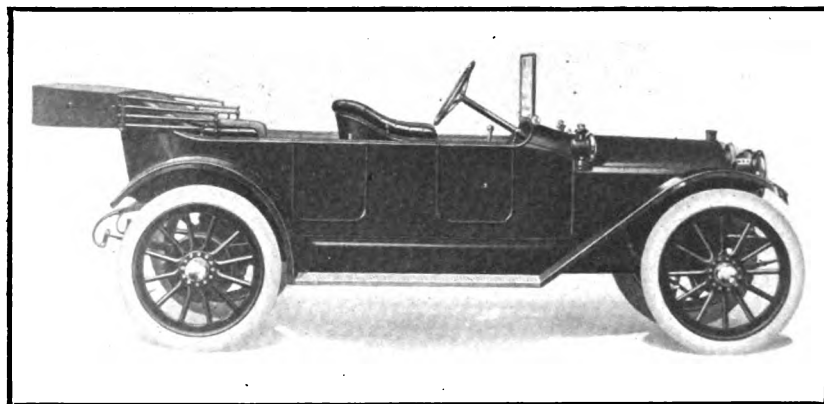
The front half of the housing of the universal joint is cast integral with the rear section of the transmission case, and with the pressed steel cap which is bolted to it, forms the socket for the ball, a drawn steel part pressed and riveted to the end of the torsion tube. The two yokes and centre piece constituting the universal joint are heavy drop forgings having large bearings and the maker lays great emphasis on the construction, stating that lost motion after considerable service is positively avoided.

The rear axle is full floating type, weight of car being carried on large ball bearings mounted on the tubular housing. All bearings are sufficiently large for service in chassis twice as heavy as the Vulcan. Five pinions, instead of two, three or four, are employed in the bevel gear type of differential, and it is held that the de-

sign adds considerably to the life of these parts. The pinions are nickel steel, phosphor bronze bushed, and revolve on a drop forged spider. The bearings between the live axle and the differential housing are 4.0625 inches in diameter and .625 inch balls are utilized. The rear housing is liberally ribbed, and a pressed steel cover, readily removable, provides for easy access to the mechanism, etc.

The springs are long, have ample clearance and are proportioned to provide easy riding qualities. The rear members are 46 inches long, 1.75 wide, and are secured to large spring pads by drop forged clips. The steel utilized is a special alloy, very flexible, but tough. The spring eyes are bushed with Tobin bronze and the bolts are ground carefully to size and provided with grease cups.

The main driving gear and pinion are in keep-



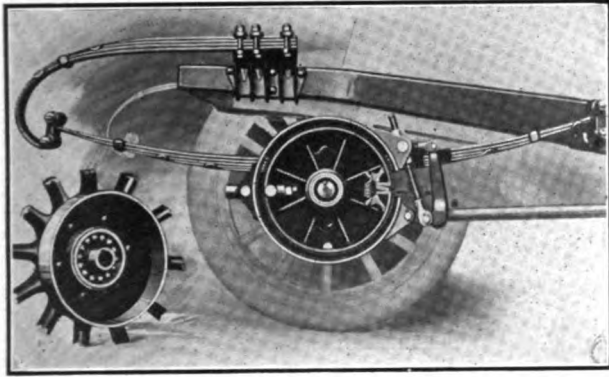
**Vulcan "27" Five-Passenger Touring Car, Having 115-Inch Wheelbase, Attractive Lines and Full Equipment.**

being of ample dimensions. Lubrication is by a combination of the positive feed and constant level splash type, a plunger pump forcing the oil from a six-quart reservoir. The carburetor is a standard make, supplied with hot air from the exhaust manifold, and ignition is by a true high-tension magneto mounted on a bracket cast integral with the crankcase. Cooling is by thermosyphon, aided by a 12-inch fan, and the water pipes and jackets are of very liberal dimensions.

The motor, clutch and transmission are a unit having a three point suspension, it differing from usual practise in that the rear cross member is bolted through the centre of the transmission casing, making for a sturdy construction. The clutch is a leather faced cone in which easy but positive engagement is emphasized, and it is held that it may be disengaged by a slight pressure, a feature which will appeal to women drivers. The



ing with the balance of the sturdy design. The main gear is machined from a solid drop forged ring of 3.5 per cent. nickel steel, and the pinion



**The Springs of the Vulcan Are Long and the Brakes Liberal in Size.**

from a solid bar of the same alloy. The teeth are planed with the Gleason gear tooth generator, insuring accurate proportions. The teeth have an 1.25-inch face, and those on the driving pinion are reinforced by an added brace running back .375 inch beyond the tooth on the gear hub. A large New Departure ball bearing is utilized immediately back of the driving pinion.

The brakes are large and the leverage of both sets is so proportioned that a gentle pressure is sufficient to stop the car. The service brake is of the external contracting type, operated by pedal, while the emergency is internal expanding, actuated by the conventional hand lever. Both brake bands are faced with asbestos. The drums are of pressed steel, securely retained.

The equipment is complete, including mohair top with side curtains and envelope, large sized gas headlights, Prest-O-Lite tank, oil side and tail lights, automatic windshield, speedometer, horn, full kit of tools, tire repair kit, jack, pump, etc.

The company calls special attention to its methods of manufacture, stating that its high grade product and low selling price is due to its production in large quantities. Considerable time was spent by the company in the preparation of special jigs, dies, tools and machinery which, with a small overhead expense, enable the production of parts and units in quantity without sacrificing quality. The inspection of each part entering into the chassis is extremely rigid and as a result all parts are interchangeable and do not require any machining, filing, etc., to fit. The company maintains its own foundry and every piece of material is carefully selected. Drop forgings are utilized wherever possible, and pressed steel

parts employed where lightness and strength are desirable. The selling policy, which is liberal, was outlined in The Automobile Journal in the issue of Sept. 10.

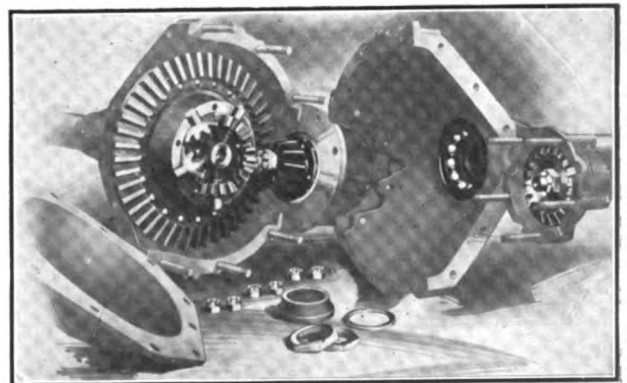
### TO REACH MOOSEHEAD LAKE.

#### Maine Automobile Association Advises State to Develop This Territory.

The Maine Automobile Association has taken active measures to bring to the attention of the new state highway commission the desirability of developing the Moosehead lake region. It suggests a highway from Greenville to Kineo Station, or from the so-called Quebec road to the latter point by way either of Parlin Pond or Jackman. It is stated that on either route the big lumber companies have built several miles of good road, so that there will be only from 15 to 18 miles of new construction.

It is maintained that the Moosehead lake region is to become one of the greatest pleasure spots in the entire state, as well as the scene of much business activity. At present, this greatest lake in the state, and one of the largest in the eastern section of the United States, has only one road leading to it, this being the one with terminus at Greenville Junction. The remainder of the miles of shore can only be reached by steamer from Greenville, and by one line of railroad at Kineo Station.

The C. A. Edgerton Manufacturing Company, Shirley, Mass., maker of President suspenders, has purchased six Overland cars, made by the Willys-Overland Company, Toledo, O., to be pre-



**Vulcan Rear Axle, Showing Pinion, Differential and Large Heavy Duty Bearings Employed.**

sented as prizes to the six jobbers disposing of the largest amount of this concern's product during a given period.





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**UNIFORM TRAFFIC RULES.**

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The more general adoption of the automobile, both as a pleasure and a commercial vehicle, has brought about traffic conditions which are only just beginning to be appreciated by the public at large. That the swiftly moving mechanical conveyance adds a new element of danger has long been conceded, and determined effort has been made to reduce this danger to a minimum. Practically the first attempt to give the matter scientific consideration is found in the appointment of a committee for this purpose by the International Travel Club.

This committee, as is more or less well known, will not confine its investigations and recommendations to the use of highways by automobiles,

but the entire subject will be reviewed, including railway, trolley and steamship traffic. Men of prominence in various walks of life have been selected to act upon the reports of special investigators who are studying the problems presented both in this country and abroad. Naturally, the first attention will be given to the matter of congestion in the larger cities, but it is proposed to continue the investigation so as to cover the entire field.

The problems are somewhat numerous and varied. Certain conditions doubtless will be recognized as impossible of improvement. It is to be hoped, however, that the committee will have little difficulty in securing the co-operation of those upon whom will devolve the authority for enforcing the uniform traffic regulations which are expected to result from its deliberations. Law abiding motorists are quite as much interested in eliminating the dangers to which they, as well as other users of the highways, are subjected.

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**OPINIONS CONCERNING THE TARIFF.**

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Importers of automobiles, as represented by those with headquarters in New York City, appear to be highly pleased with the passage of the so-called Underwood tariff, which lowers the rate on chassis and parts from 45 to 30 per cent. ad valorem. In view of the fact that very few cars, selling either above or below \$2000, are imported with bodies, this portion of the new tariff bill undoubtedly will have little effect upon the industry in America. Importers declare that the new rate will have decided influence upon the importation of commercial vehicles, although it is difficult to understand at this time, just why this result is to be expected.

If the opinion of Detroit manufacturers may be taken as expressing that of the industry in this country, there does not appear to be any general feeling of unrest at this time. With but one exception representatives of the Detroit makers are quoted as saying that the new rate will have but little effect upon them, one way or another. The exception is that of a producer of popular priced cars, who looks for more or less depression in general trade conditions with a natural reaction on the motor car industry which only the future can reveal. Of course, it is much too early to forecast results as yet.



## NEW AND NOVEL ACCESSORIES THAT APPEAL TO MOTORISTS

**Typhoon Horn.**

The Typhoon Signal Company, Chicago, announces a new type of Typhoon electric horn known as type F, and although it is a popular priced signal, it is covered by a very liberal guarantee. It is constructed in two styles. One has a six-inch projector for mounting on the outside of the car, and this model is finished in three styles, namely: All black enamel, nickel and black enamel, and brass and black enamel. The other type is made expressly to be placed under the hood and is fitted with a long projector to project the sound. It is finished in all black. It is stated that short circuiting is prevented by utilizing a 7.5-inch flexible tubular connection for the wiring to the horn, and the construction eliminates the conventional use of terminals for attaching the leads from the battery. The signal is designed to be operated on any standard six-volt battery, and full length wire cable and push button are included in the equipment. The tone is said to be clear and penetrating, but not discordant.

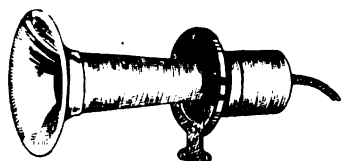
**Shiller Cigarette Holder.**

The Shiller Manufacturing Company, Chicago, is marketing a novelty termed the Shiller cigarette holder,

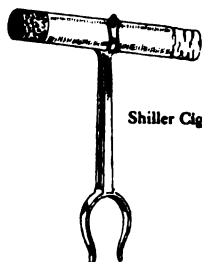
company states it produces an outfit to convert oil into electrical units, which permits use of its device. The rear light alarm comprises a compact, round, hard rubber box, containing an electro-magnet and a buzzer, the last named giving forth a strident sound when the filament of the tail lamp burns out or the circuit is broken. The box is provided with three terminals, one of which is connected directly to the battery, while the others are connected across the lamp terminals. A switch is also included. The device operates on a six-volt circuit and consumes practically no current as the buzzer may be cut out by the switch as soon as it sounds. The equipment comes packed in a neat box, and includes suitable length of wire, etc. It is moderately priced.

**Pioneer Batterymeter.**

Motorists who pay attention to details realize the importance of giving the storage battery utilized with lighting and motor starting systems that care that is necessary for maximum efficiency. While the condition of the cells may be ascertained by the use of a voltmeter, makers of batteries recommend testing the specific gravity of the electrolyte, and for this purpose a hydrometer is used, an instrument permitting of fine readings not



Typhoon Horn



Shiller Cigarette Holder



J-M Spark Plug



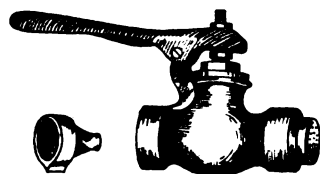
Rear Light Alarm



Pruden License Holder



Pioneer Batterymeter



Ideal Automatic Hose Attachment

which is a device that may be located in any desired position, either on the steering wheel or other convenient place on the car. The lower part of the holder is provided with a clamp for attaching to the steering wheel, for example, while the upper end clasps the cigarette.

**J-M Spark Plug.**

The H. W. Johns-Manville Company, New York City, is manufacturing a spark plug which carries with its sale a guarantee of 10,000 miles of service and the company states that any plug failing to give satisfaction will be replaced by a new one. One of the features of the J-M is the use of double insulation, it comprising mica and porcelain, the former being wound around the electrode. It is stated that the dual insulation, either of which is sufficient to insure perfect sparking, will withstand high voltages. The J-M spark plug is made in all sizes; is adapted to either battery or magneto currents, and is moderately priced. The company issues a booklet on ignition which will be mailed upon request.

**Rear Light Alarm.**

The enforcement of the ordinances respecting the tail light has led to the marketing of a number of devices for notifying the driver when the lamp is extinguished and these are made both for electric and oil lamps. The Guaranteed Specialties Company, Kinney building, Newark, N. J., is manufacturing the rear light alarm, which is designed for electric lighting equipments, although the

possible with the voltmeter. The Northwestern Chemical Company, Marietta, O., manufactures several types of instruments for this work and the Pioneer batterymeter No. 1 is shown in an accompanying illustration. It comprises a hydrometer enclosed in a sturdy glass tube and the electrolyte is drawn into the device by a rubber bulb. A suitable snout for inserting through the opening in the cells is also incorporated. The Pioneer batterymeter is nicely made and is guaranteed to be accurate in its readings.

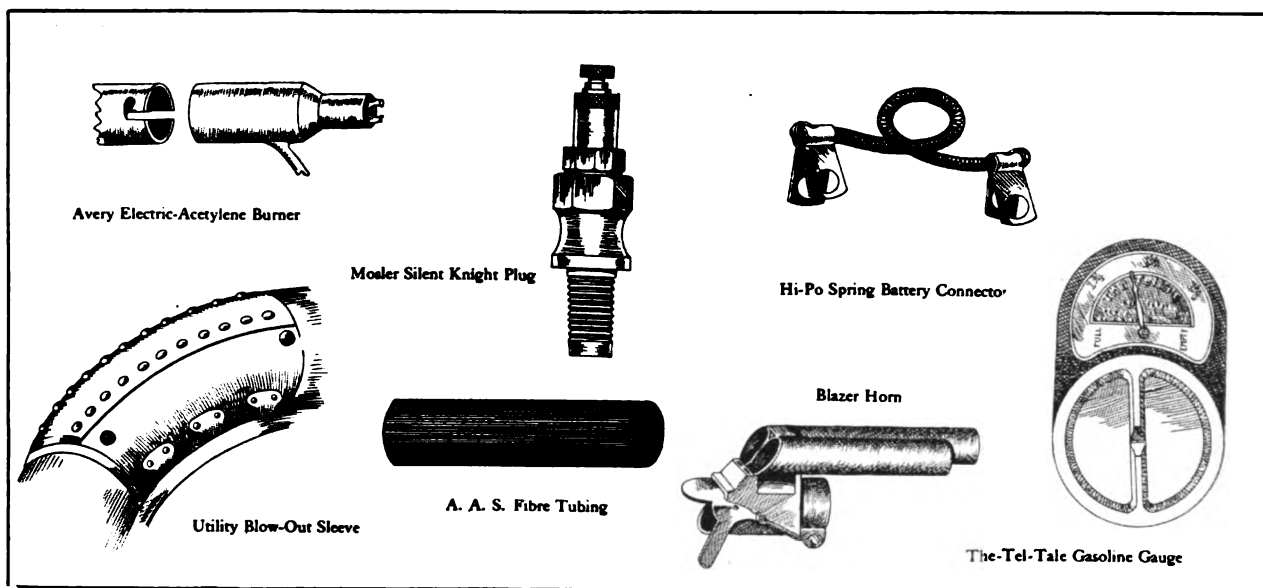
**Pruden License Holder.**

The laws of many states require that the car license be carried either in the machine or upon the person. When it is carried in the clothing and this changed, one is likely to forget to transfer it. The W. E. Pruden Hardware Company, 260 West 52nd street, New York City, is marketing the Pruden license holder, comprising a metal case so constructed as to retain the license and protect it from injury. The holder is fitted with a Corbin lock and an extra key is included.

**Ideal Automatic Hose Attachment.**

There is no doubt that the water wasted in washing motor cars represents a large sum. Many owners and chauffeurs allow the water to run when cleaning the machine, by dropping the hose instead of shutting off the supply until again needed. The Gaylord Sanitary Manufacturing Company, Rochester, N. Y., is marketing the





Ideal automatic water saver attachment, which is stated will earn its cost in 30 days where metered water is used. The device is secured to the conventional hose and is equipped with a lever which normally shuts off the supply when pressure is released. Being very compact and designed to fit the hand, it is a simple matter for the operator to compress the lever, which action allows the water to flow. A spray or jet nozzle is included, making it possible to vary the size of the stream and according to the character of the work. The Ideal comes in polished brass or nickel plated and is not expensive.

#### **Avery Electric-Acetylene Burner.**

P. C. Avery, president of the Acetylene Gas Company, Milwaukee, Wis., has brought out an auxiliary or emergency burner for electric lighting systems, permitting the use of acetylene in the event trouble is experienced with the lighting equipment. The new device comprises an acetylene burner, which may be fitted into the electric lamp socket by removing the bulb. The gas burner is connected to an auxiliary gas tank by a tube leading out through the front of the electric lamp. The glass cover is removed when the burner is in service, making it unnecessary to drill a special hole in the lamp as a lead for the tube. It is claimed that the flame will not blow out in the strongest wind. The device is inexpensive.

#### **Mosler Silent Knight Plug.**

Spark plug construction and location are being given more attention by engineers than formerly, and, coupled with the high efficiency of the magneto, ignition troubles are reduced to a minimum. A. R. Mosler & Co., Mt. Vernon, N. Y., produces a large variety of spark plugs to meet the varying requirements of different motors and in an accompanying illustration is shown the Mosler Silent Knight plug, which embodies the well known Split-fire characteristic, namely, the protected central electrode. The plug is constructed to operate satisfactorily in splash of oil and to fire accurately under compression. It is constructed in metric sizes, platinum pointed, also in a 7/8-18 open end, two point type. Both are designed to withstand high voltages and the burning effect of magneto currents.

#### **Hi-Po Spring Battery Connector.**

Loose dry cell battery terminals are annoying and with ordinary members care must be exercised in tightening else the battery terminal will be broken. The Hi-Po Waterproof Battery Company, 1007 Atlantic avenue, Brooklyn, N. Y., is marketing the Hi-Po spring battery connector, which is stated to be self-locking. It is attached with the fingers, and it is also claimed that it will not jar or loosen in service. Another advantage pointed out in the design is that a perfect contact is obtained thereby increasing the efficiency of the cells. A feature of the terminal employed is that the wire may be secured without soldering, a patent tie making a perfect electri-

cal connection. The construction and method of attachment to a cell is made clear in an accompanying illustration.

#### **Utility Blow-Out Sleeve.**

The Utility blow-out sleeve is produced in several forms by W. L. Johnson & Co., Endicott, N. Y. That illustrated is termed style D and is constructed from a one-piece heavy chrome split leather and is provided with an additional tread thoroughly studded. The last named feature prevents skidding. This type of sleeve does not require straps or laces, hooks fitting the rim. It is claimed that the sleeve cannot creep as it is held securely by inflating the tire. The leather is soft and pliable and is held to be water proof. The Utility blow-out sleeve is made in lengths varying from six to 12 inches and in sizes from three to five inches.

#### **A. A. S. Fibre Tubing.**

Hard vulcanized fibre tubing is employed for a large number of useful purposes, such as carrying the high-tension leads, wiring electric lighting systems, socket linings, bushings, etc. Being very tough and durable it can be forced in place without danger of breakage and it also may be machined and cut easily. The American Auto Supply Company, 1741 Broadway, New York City, and 1408 South Michigan avenue, Chicago, is marketing a hard vulcanized fibre tubing which comes in 24-inch lengths and has inside diameters of 1.125 and 1.5 inches. The thickness of the walls is .09375 inch. The net weight of each tube is 20 ounces. It is inexpensive.

#### **Blazer Horn.**

The Motor Specialties Company, Waltham, Mass., is marketing a new exhaust operated horn, which is not only moderately priced, but may be attached easily and without alterations to the exhaust pipe or muffler. It is secured to the exhaust pipe by a special clamp and may be locked with a screw driver. The horn proper is stationary and one of its features is that the tubes extend toward the front of the car, insuring an efficient signal even when the motor is operating slowly. The gases are deflected to the tubes by a simple lid device which does not impede the egress of the gases, thereby eliminating opportunity of purring noises when the horn is not being utilized. The construction is simple and high grade throughout and the maker states that it will not clog. It is designed especially for model T Ford automobiles.

#### **The-Tell-Tale Gasoline Gauge.**

The Bundy-Goebel Manufacturing Company, Detroit, Mich., is producing an ingenious device for indicating the amount of gasoline in the fuel tank. The Tell-Tale gauge is not only compact, but it is stated that it may be fitted to the fuel container in less than two minutes and that after installation requires no attention. One of the features of the device is that the tank may be filled with-



out disturbing the gauge, a filler cap of neat appearance being provided. The gauge is oval, one section comprising a calibrated face, over which moves an indicating hand. As the gauge may be placed in plain view, as with a roadster type of car, the driver may ascertain the amount of fuel on hand from the seat by simply turning his head. The Tell-Tale is constructed for various types and makes of machines, including roadsters, runabouts, touring, etc., and is inexpensive.

#### Shino Mitten Duster.

The Pioneer Manufacturing Company, Cleveland, O., is marketing the Shino mitten duster, which is formed to fit the hand and to make easy the cleaning and polishing of the upholstery and body of the motor car. The duster is chemically prepared, and it is claimed that it will absorb all dust and that the texture of the material is so fine and soft that it will not scratch the finest of surfaces. It is also stated that crevices in the upholstery, where dust collects, are reached easily.

#### Radio-Escape.

The Radio-Escape, so named because it is designed to prevent evaporation of the fluids utilized in the radiator, is manufactured by the Globe Machine & Stamping Company, Cleveland, O. It is made in two styles, that illustrated being known as B, and is adapted to any type of radiator cap. It is fitted by tapping and drilling a hole and it is stated that the device is entirely automatic in its action. By its use it is claimed that evaporation is held to less than a quart for an entire season, and that it makes for economy when alcohol or other antifreezing solutions, subject to evaporation, are employed. Type A is made for new cars.

#### Weld Extra Jet.

The Weld Manufacturing Company, North Chatham, Mass., announces the Weld extra jet, which is designed to make starting of the car easy in cold weather as well as to eliminate the trouble of priming the cylinders. The entire operation is controlled from the seat, a small, compact lever being utilized, which may be operated by the foot. The principle of the device is that of providing a rich mixture to the cylinders for starting and operation until the motor has become sufficiently warm to operate efficiently under the normal mixture. The Weld differs from the usual types of priming devices in that the fuel is completely vaporized, properly mixed with air and conveyed to the intake manifold in proximity to the cylinders, thereby eliminating opportunity for condensation or precipitation through long contact with the cold metal walls of the induction pipe. The extra jet takes gasoline from the float chamber of the carburetor, and, as the opening is above the fuel level of the float, leakage is not possible. The size of the extra jet is approximately .75 by 3.5 inches. Connection from the jet to the actuating handle is by means of a small brass chain. It is stated that it is attached without soldering, only two small holes being required for an .125 inch pipe. In addition to mak-

ing for easy starting it is pointed out that the adjustment of the carburetor will not require changing to enrich the mixture for cold weather starting.

#### Peerless Steam Pad Vulcanizer.

The Peerless steam pad vulcanizer is produced by the Leader Manufacturing Company, 3049 West 25th street, Cleveland, O. Its face is concaved to conform to the outline of the casing and suitable side brackets are provided for the tension chain, which is secured by eye bolts locked with wing nuts. It is stated that it will vulcanize a patch on a tube or casing from a puncture to a patch nine square inches. It takes but two to five minutes' application of the hydrocarbon heater to generate sufficient heat to vulcanize thoroughly and a water pad automatically prevents burning either the patch or surrounding rubber. The equipment includes suitable material to make repairs to tubes and casings. It is moderately priced.

#### Wade & Fisher Foot Stirrup.

Wade & Fisher, 3807 Lake avenue, Chicago, is introducing the Wade & Fisher foot stirrup attachment, which is a practical device and one designed to save considerable labor when a wheel must be jacked up to change a tire or for other work. It comprises a metal stirrup, shaped to conform to the foot and having a flexible band at the top. This band is utilized to prevent the foot from slipping when the handle of the jack, to which the device is clamped, is moved upward. The clamp is so constructed that it will fit any type jack handle and as the stirrup swivels it may be permanently attached. To operate, the foot is placed in the stirrup, enabling operation of the jack without stooping and soiling the clothing.

#### Liberty Bell.

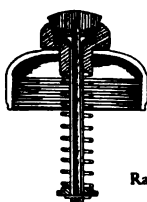
The Liberty bell, manufactured by the Liberty Bell Company, 346 The Arcade, Cleveland, O., differs from the usual electric signalling devices in that it is an actual bell having a tongue actuated on the current of four standard dry cells. It is five inches high, five across the base, and can be mounted on any convenient place on the car, and being surmounted by an eagle, presents an attractive appearance. The tone is said to be unusually pleasing and effective, being distinct but mellow. It is stated to be water, dust and fool proof and a suitable length of cord and switch accompany each signal. The construction of the bracket is such as to make for easy installation.

#### Shawver Storage Stands.

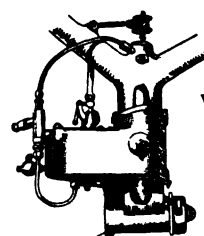
The Shawver Company, Springfield, Mass., is manufacturing the Shawver storage stands, which are moderately priced and designed especially for service when the car is stored for the winter. They come in sets of four and are placed under each axle of the machine, relieving the tires of all weight. Each stand has a suitable, substantial base, and by means of a screw thread arrangement may be adjusted to various heights. It is not necessary to jack up the car as the stands are operated easily.



Shino Mitten Duster



Radio-Escape

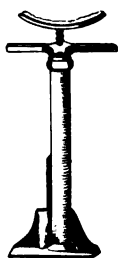


Weld Extra Jet

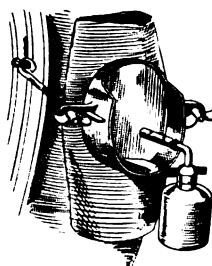
Wade & Fisher Foot Stirrup



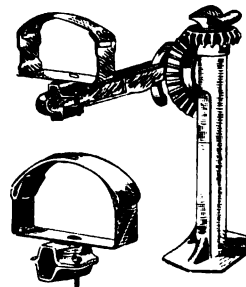
Liberty Bell



Shawver Storage Stand



Peerless Steam Pad Vulcanizer





## IMPROVED ROADS AND MOTORING LAWS.

### Tariff Is Reduced on Automobiles and Motorcycles--Half of the Lincoln Highway Money Is Already Subscribed--How Colorado Funds Are Distributed.

CONGRESS appears to have given but little heed to the representations of the motor car industry in the final draft of the so-called Underwood tariff bill, which became a law upon receiving President Wilson's signature, Oct. 3. In its original form, the rate on completed automobiles and chassis was placed at 45 per cent., as under the so-called Payne tariff. Parts, excepting tires, were listed at 20 per cent.

The industry maintained that this virtually provided a tariff of 20 per cent. on automobiles, since very few complete cars were imported and it would be possible to import chassis parts and assemble them on this side. As a result of these representations cars and bodies were left at 45 per cent. and chassis and parts were placed at 30 by the House. The final draft was prepared in conference and reads as follows:

Automobiles, valued at \$2000 or more, and automobile bodies, 45 per centum ad valorem; automobiles, valued at less than \$2000, 30 per centum ad valorem; automobile chassis and finished parts of automobiles, not including tires, 30 per centum ad valorem.

It would appear that this had the effect of reducing the tariff on automobiles to 30 per cent., if the reasoning of the industry's representatives were to be accepted. And this rate actually is made to apply to cars valued at less than \$2000.

The old rate on motorcycles was 45 per cent., and the original Underwood bill fixed this at 40. The final draft, which reads as follows, does not appear to give this branch of the industry as much protection as was at first intended:

Bicycles, motorcycles and finished parts thereof, not including tires, 25 per centum ad valorem.

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#### LINCOLN HIGHWAY FUND.

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#### Treasurer Reports That Subscriptions Now Total More Than \$5,000,000.

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Half of the money needed to insure the construction of the concrete road from New York to San Francisco, to be known as the Lincoln highway, has been subscribed, according to the report of Treasurer Emory W. Clark of the Lincoln Highway Association. This means that the pledges now total more than \$5,000,000, and the officials of the association feel certain that the

grand total of \$10,000,000 will be reached before July 1, 1914.

The route, announcement of which was made in the last issue of The Automobile Journal, will be dedicated by formal exercises at various points between the two coasts on the night of Friday, Oct. 31. The arrangement of programme will be left to the local committees in the several centres, and it is understood that in many of the smaller towns and villages along the way there are to be torchlight parades, in which wagons, farm machinery, automobiles, motorcycles and other conveyances will appear.

At these meetings plans to rename each section of the Lincoln way will be broached. Local designations are to be dropped. Markers, each consisting of a strip of red three inches wide, white 15 inches in width and a blue strip three inches wide, with a letter L in blue on the white section, are to be set up all along the way from coast to coast. The first of these was placed at Clinton, Ia., Monday, Sept. 15, by W. F. Coan, president of the Clinton National Bank, and state consul for Iowa. Such consuls are to be appointed in each state, with authority to name deputies for the purpose of soliciting individual subscriptions for the project.

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#### COLORADO'S LICENSE FEES.

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#### How Money Received from Automobile Owners Is Distributed for Good Roads.

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Secretary of State Pearce has made his first accounting under the new automobile law, which went into effect in Colorado, July 15. It may be pointed out, of course, that hardly more than two months have elapsed since the first license fee was collected, but it must be assumed that practically all of the cars owned within the state have been accounted for in the reckoning. The total of fees collected during this period, these being for registering cars and motorcycles and licensing drivers, was \$54,310.50. The expense of operating the new department has figured out at about eight per cent., although it is expected that this will be reduced to nearer six per cent. next year.

Under the provisions of the new law, half of the net revenue (in this instance, \$24,998.35) is



turned over to the state highway commission, while the remainder is distributed among the counties, in the proportion indicated by the amount of fees collected from each. This is assumed to be a fair method of distribution, at least in theory, but the way in which it works out in practise is indicated by the following table:

| County              | Received           | Returned           |
|---------------------|--------------------|--------------------|
| Adams .....         | \$445.00           | \$208.41           |
| Arapahoe .....      | 333.00             | 147.29             |
| Archuleta .....     | 65.00              | 28.64              |
| Baca .....          | 32.00              | 11.89              |
| Bent .....          | 386.50             | 173.64             |
| Boulder .....       | 1,722.50           | 762.62             |
| Chaffee .....       | 476.00             | 217.16             |
| Cheyenne .....      | 132.50             | 61.63              |
| Clear Creek .....   | 113.00             | 51.06              |
| Conejos .....       | 503.50             | 227.35             |
| Costilla .....      | 226.00             | 105.35             |
| Crowley .....       | 313.50             | 144.10             |
| Custer .....        | 72.50              | 32.23              |
| Delta .....         | 603.00             | 261.54             |
| Denver .....        | 21,581.00          | 9,972.23           |
| Douglas .....       | 161.50             | 71.93              |
| Eagle .....         | 63.00              | 28.43              |
| Elbert .....        | 151.00             | 68.12              |
| El Paso .....       | 4,389.50           | 2,047.90           |
| Fremont .....       | 1,166.00           | 540.99             |
| Garfield .....      | 309.50             | 140.85             |
| Gilpin .....        | 13.50              | 5.82               |
| Grand .....         | 52.50              | 22.69              |
| Gunnison .....      | 190.00             | 86.86              |
| Hinsdale .....      | 7.50               | 2.94               |
| Huerfano .....      | 196.00             | 86.54              |
| Jackson .....       | 47.00              | 20.40              |
| Jefferson .....     | 590.50             | 274.07             |
| Kiowa .....         | 156.50             | 71.26              |
| Kit Carson .....    | 242.50             | 108.68             |
| Lake .....          | 116.50             | 51.47              |
| La Plata .....      | 335.00             | 154.86             |
| Larimer .....       | 3,191.00           | 1,491.13           |
| Las Animas .....    | 1,025.00           | 473.39             |
| Lincoln .....       | 269.00             | 122.86             |
| Logan .....         | 885.00             | 407.56             |
| Mesa .....          | 725.50             | 326.75             |
| Mineral .....       | 29.00              | 12.69              |
| Moffat .....        | 74.50              | 14.18              |
| Montezuma .....     | 163.50             | 72.89              |
| Montrose .....      | 457.50             | 207.41             |
| Morgan .....        | 892.00             | 418.50             |
| Otero .....         | 1,490.00           | 691.06             |
| Ouray .....         | 47.50              | 20.64              |
| Park .....          | 167.50             | 74.45              |
| Phillips .....      | 378.50             | 169.10             |
| Pitkin .....        | 62.00              | 28.67              |
| Prowers .....       | 679.50             | 304.83             |
| Pueblo .....        | 2,404.00           | 1,104.53           |
| Rio Blanca .....    | 56.50              | 25.29              |
| Rio Grande .....    | 695.50             | 316.14             |
| Routt .....         | 158.00             | 71.25              |
| Saguache .....      | 297.50             | 132.38             |
| San Juan .....      | 2.50               | .75                |
| San Miguel .....    | 37.50              | 16.72              |
| Sedgwick .....      | 258.00             | 116.50             |
| Summit .....        | 33.00              | 14.22              |
| Teller .....        | 735.50             | 345.25             |
| Washington .....    | 273.50             | 123.93             |
| Weld .....          | 3,190.00           | 1,487.92           |
| Yuma .....          | 439.00             | 199.01             |
| <b>Totals .....</b> | <b>\$54,310.50</b> | <b>\$24,998.35</b> |

It will be noted that Denver county contributed approximately 40 per cent., and about 19 per cent. of the total is returned to it. The motorists of that county therefore pay a little better than 20 per cent. of this fund available for good roads work throughout the state, although,

of course, the state highway commission may decide to spend any portion of its share of the total sum it desires in Denver county. On the other hand, it would appear that many counties receive but little direct benefit from the distribution, and must depend very largely upon the state highway commission for funds. This applies particularly to San Juan county, which is in size about equal to half the State of Rhode Island, and which receives 75 cents as its share of the automobile money.

### WANTS STILL MORE ROADS.

#### Would Connect South and Southwest with the Rest of the Country.

While it lends its unqualified indorsement to the Lincoln Highway project, the Manufacturers Record, Baltimore, Md., a trade publication devoted to the industrial, financial and general business interests of the South and Southwest, presents an editorial argument for a highway of similar character connecting the North and West with the South and Southwest. It suggests that the interests of these sections are such that a highway of this character would make possible material development and increase business to such an extent as to make it worth many times the cost.

Its plan is to have a road, built of the best materials obtainable and open for travel at all seasons of the year, running from New York to Florida, thence along the Gulf to New Orleans, there to connect with another highway from the Central West, and continue into Texas. It maintains that if men of the highest financial and business standing in the South, men who have achieved great things in other undertakings would formulate such a plan and push it with the vigor exemplified by the Lincoln Highway Association, it would be found that the very interests which are contributing so liberally to that project would contribute with equal liberality to the new proposition.

The United States Department of Agriculture has recently issued, as bulletin No. 23 of the new departmental series, a contribution from the office of public roads on vitrified brick as a paving material for country roads. The materials used and the process of manufacture are described, as well as methods of testing the bricks. Special attention is directed to the importance of proper engineering supervision.



## CORRESPONDENCE WITH THE READER.

### Rewiring Model T Ford.

(1653)—Am planning to rewire my model T Ford as the old wires are covered with oil and those on the timer are in bad shape. The timer is hard to get at, unless the radiator is taken off and I do not wish to do this. As the wires leading to it run through a tube I am afraid to tackle the job without a wiring plan and some help. A friend of mine stated you published a drawing some time ago showing how the work is done. If it would not take up too much of your valuable space and time I would appreciate a few suggestions on the work.

JOURNAL READER.

Shannock, R. I., Sept. 29.

The drawing referred to was published some time ago and it dealt with locating ignition troubles, although the wiring plan was shown. It is reproduced at Fig. 1 and it will be noted that the primary and secondary wiring plan is also depicted.

The rewiring may be accomplished without

cells may be utilized with a lamp or bell. Connect the end of one wire to the carbon of the cells and the lamp or bell to the zinc. By taking each wire and touching the free end to the lamp, for example, it will light when the proper wire is used, as it completes the circuit. The wire can then be marked. The other wires may be tested similarly.

Attach the wires to the timer as shown in the drawing, which indicates the direction of rotation of the shaft; in this instance, anti-clockwise or to the left. Replace the timer, insert pin and lock with nut. The wiring of the secondary leads is simple and as these are numbered in the diagram, no difficulty should be experienced in the work. The coil is shown at B and no attention should be

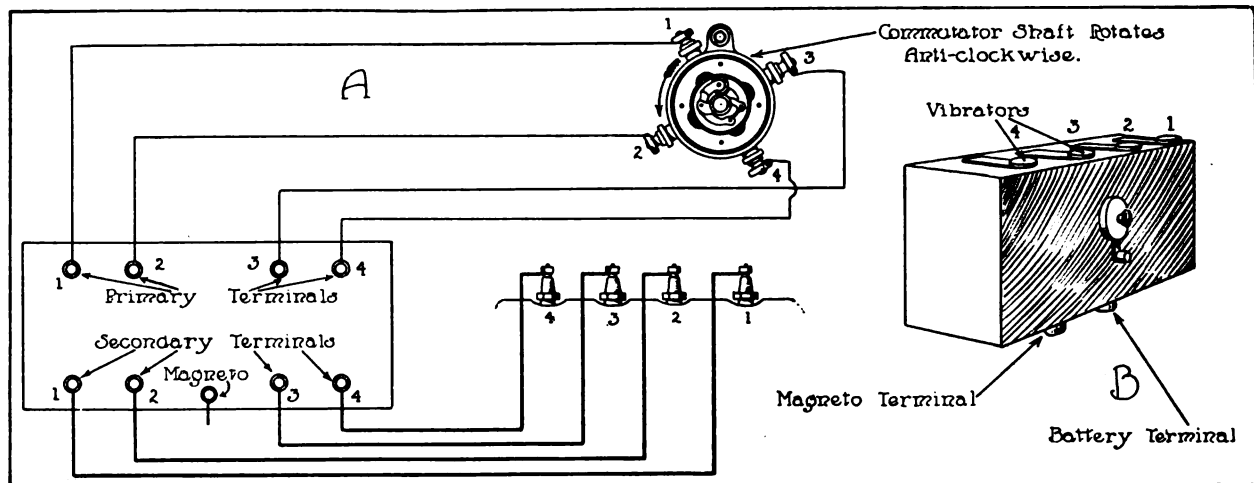


Fig. 1—Showing Wiring Plan of Model T Ford, Direction of Rotation of Commutator Shaft and Firing Order of the Motor.

trouble by studying the diagram and ascertaining the firing order of the motor, which is 1, 2, 4, 3, beginning with the cylinder nearest the radiator. The timer is retained by a nut which, when removed, will enable the withdrawal of a pin or key. After displacing the last named member care must be taken not to crank the motor. Remove the timer and displace the primary connections.

Next, disconnect the wires at the primary terminals on the coil, and pull the leads from the tube. They will serve to obtain the dimensions required for the new wires. There are several ways of identifying which wire is which after the four have been drawn through the tube. One is to tag one end, marking it 1, 2, 3 or 4, as the case may be, and to tie a similar number of strands of white string on the other end. Or, dry

paid to the numbers as these were utilized to explain an ignition trouble.

### Cleaning Oil Sight Feeds.

(1654)—I have an oil sight feed on the dash of my car and there are five glasses through which the dropping of the lubricant may be seen, to regulate the supply. These glasses are hard to keep clean as you can't get a cloth in back of them. The garage man says not to take them apart as I would have trouble in getting them tight again. How do they clean them inside and out?

OWNER.

Taunton, Mass., Sept. 29.

The repairman gave good advice, as it is difficult for a novice to disassemble this type of oiler and replace the parts without leaks. To clean the glasses on the inside, disconnect the large tube carrying the lubricant into the feed members. It is best to disconnect it at the oiler proper and loosen the nut at the other end of the tube. Swing the pipe upward and squirt in gaso-



line. This will flush out the interior of the glass members.

At Fig. 2 is shown a method of cleaning the

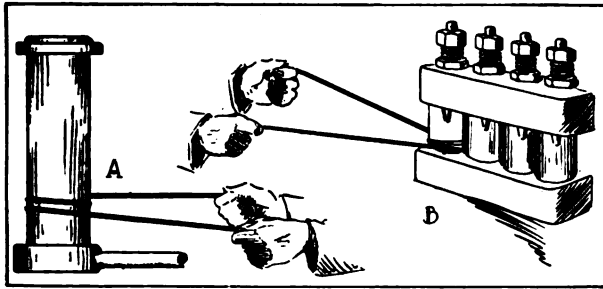


Fig. 2—Illustrating Method of Cleaning Oil Sight Feed Glasses by Utilizing String.

exterior. Take a piece of soft cotton string or cord, pass it back and around the glass as shown at A, and by moving the hands back and forth the string will clean the glass very nicely. If the surfaces are covered with old oil, it is best to soften it with a little gasoline.

#### Adjusting Bosch Magneto.

(1655)—I purchased a second hand car some time ago and until recently it has been running good. It has two sets of ignition, batteries and a high-tension magneto, a Bosch. I am having trouble with the magneto and think it needs cleaning and probably some little adjustment. It is the kind having a three-arm or spider, and the breaker box has two circular extensions. Noting you advise your readers on repairs I trust you will give me instructions and illustrate the same if possible. NEW SUBSCRIBER. Lancaster, Penn., Sept. 27.

If the magneto has not been cleaned and the breaker points adjusted for some time, giving these members attention may cure the trouble. At Fig. 3 is shown the magneto referred to with the distributor and breaker box mechanism exposed. The last named parts are accessible by loosening the lock nut on the ground terminal member, and slipping to one side the flat spring holding the cover in position. The cam housing may then be displaced as shown in the illustration.

The distributor cover is retained by a spider held in position by three screws. Upon removing these the distributing brush and its holder will be exposed. Clean these parts with a soft brush, taking care to remove all foreign elements, and if very dirty the brush may be dipped in a little gasoline. Do not use oil of any kind. Exam-

ine the brush and note if it makes contact with the various segments. It is possible that the spring needs stretching slightly. If the brush makes proper contact it may be assumed that the breaker mechanism is at fault.

This differs from conventional practise in that small fibre rollers are placed at the sides of the contact breaker housing, which merely oscillates, the entire breaker mechanism revolving on the end of the armature shaft. The fibre cam rollers may stick, causing them to wear flat on the surface with which the contact lever comes in contact. These rollers should rotate freely on their bearing points, but not have too much lost motion or play. Have some one turn the motor while the make and break of these members is noted. It will be well to clean the mechanism, but do not lubricate any of the parts, as oil will affect the fibre, causing it to swell and create trouble.

Examine the contact points and if these be pitted or dirty, clean with a very fine file, taking care not to remove too much of the platinum and also to have the point contact squarely. In re-adjusting the points it will be noted that a lock nut holds the adjusting screw, and by loosening this and moving the platinum screw in or out, the proper break may be obtained. It should be approximately .015625 inch. The Bosch Magneto Company, 225 West 46th street, New York City, maker, or any of the branches, have a special wrench for this work. In the examination

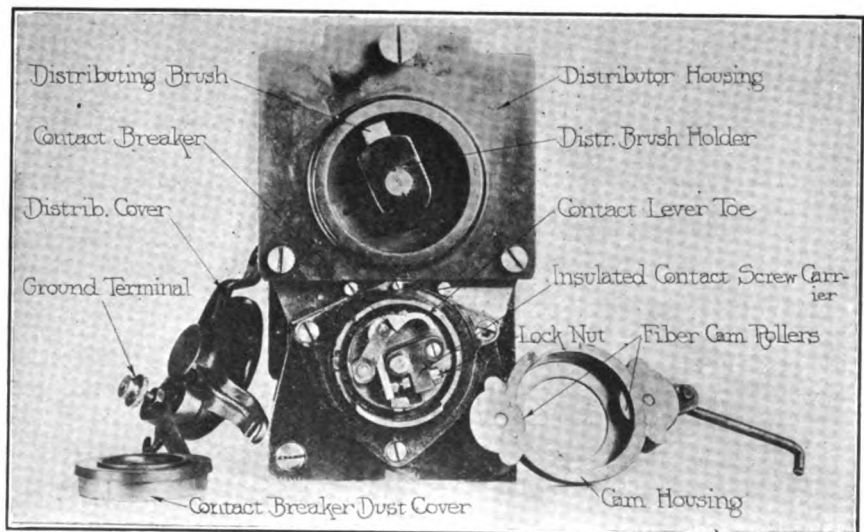


Fig. 3—Distributor and Contact Breaker Mechanism of Bosch Magneto and Components Requiring Attention.

of the magneto it is suggested that the ground wire leading from the breaker box to the switch, etc., be examined carefully and, if worn or chafed,



a new one fitted. Sometimes a faulty wire is responsible for erratic action of a magneto.

#### Bushing Valve Guides.

(1656)—I have a motor with the valve guides cast integral with the cylinder. They are badly worn and I do not care to go to the expense of taking off the cylinders, having the guides rebored and new valves and stems made. Can your mechanical man suggest a method of doing the work without removing the cylinders? Am fairly handy working on a motor as I have done my own repairs for several years.  
Kingston, N. Y., Oct. 1. J. C. S.

A method of repairing the guides is shown at Fig. 4, it consisting of rebushing these members with steel tubing, which may be procured in varying outside and inside diameters. Assuming that the inside diameter of the bushing when fin-

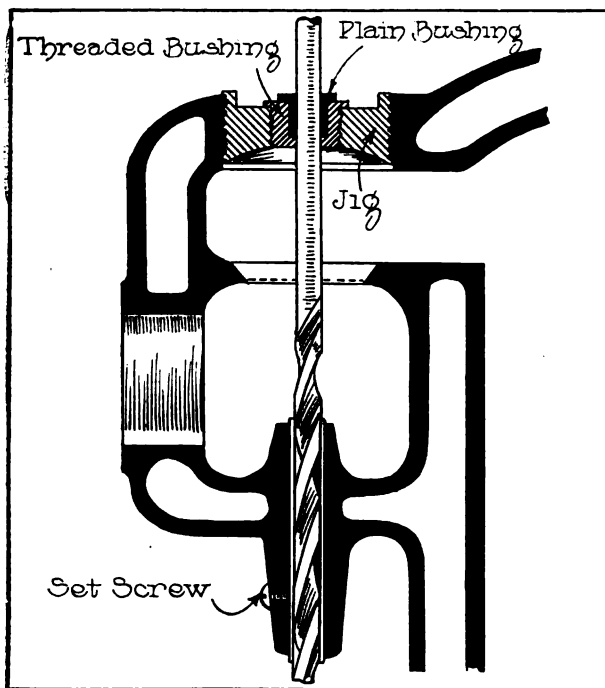


Fig. 4—Suggestion for Rebushing Worn Valve Guides with Standard Steel Tubing.

ished should be .375 inch, the diameter of the valve stem, the walls of the bushing should be approximately .0625 inch thick, making the total outside diameter of the tubing .5 inch.

As the opening of the tubing is not always concentric with the outside diameter, before drilling or reaming out the bushings in the cylinders it is advisable to true up the bushings proper. This may be accomplished by placing on an arbor of a lathe and skimming off a trifle from the outside of the tube.

A jig will have to be constructed so that an accurate hole may be assured when drilling or reaming. It may be made by fitting a bushing to the opening of the spark plug cap as shown

and the bushing should be threaded to fit the opening as depicted, also have an inside diameter equal to that of the hole to be drilled. This will insure that the holes drilled will be accurate.

The bushing or tube should be a drive fit, so that its wall will be compressed slightly, making for a close fit of the valve stems by proper reaming or drilling. For drilling the tubes another bushing, a plain member, will be needed and it should fit inside the threaded member as illustrated. Before employing the spark plug cap make sure that its hole is concentrically accurate, and if not a special cap will have to be made if a good job is to be secured.

After fitting the valve stems to the bushings, the latter will have to be secured in place. This may be accomplished by drilling a .125 or .1875-inch hole through the guide and into the bushing. The point of the drill should just enter the wall of the tubing and the recess be made just deep enough to permit the screw to grip easily. The thread must be such that it will grip the screw firmly, and the latter should have a slight taper point and conform to the drill. In setting up the screw care must be exercised, else it will crush the walls of the bushing.

#### Sliding Gear for Ford.

(1657)—As a subscriber of The Automobile Journal I would like to have you inform me if there is any form of selective sliding gear transmission that could be placed on a model S Ford runabout.  
Fulton, N. Y., Sept. 29. E. D. P.

A selective sliding gearset could be fitted to the chassis of the car mentioned, but the cost of the transmission and installation would not warrant the expense involved. The writer remembers of such an installation made to the same type of machine, the owner of which stated that the cost exceeded his expectations. In addition it would be necessary to have good brakes, also to fit some form of clutch. The cheapest and best method would be to replace any worn parts of the present planetary transmission.

The Automobile Club of Springfield, Mass., has decided to employ a business secretary and to maintain permanently open headquarters. Charles A. L. Wright has been appointed the club's representative to the good roads congress in Detroit.

The proposed amendment to the state constitution to allow a \$50,000,000 bond issue for good roads, which will be submitted to the people of Pennsylvania at the November election, was discussed at a convention of those interested in its passage held in Harrisburg last month.



## FEATURES OF 1914 STEARNS-KNIGHT.

FOR the season of 1914 the F. B. Stearns Company, Cleveland, O., maker of the Stearns-Knight, will produce two chassis, one having a four-cylinder and the other a six-cylinder motor. Both are equipped with Knight engines of the same bore, 4.25 inches. The four has a 5.5-inch stroke and the six 5.75. Four, five, six and seven-passenger bodies, favoring European design, are offered on either chassis, and a three-passenger roadster, coupe and sedan are new announcements. The limousine and landaulet are continued.

The control has been centralized by placing the lighting switch, carburetor air adjustment, ignition switch and horn control on the steering post under the wheel, a system of small rods operating in the casing surrounding the post proper, being actuated by levers conveniently located. The lighting switch, however, is of the conventional design. A change from a bulb horn to an electric is noted.

The gearset of the four has been removed from the rear axle and is now amidships. Pressure feed of the fuel with tank at the rear, Stromberg carburetor and Mea magneto are continued as standard equipment. The varying level oil troughs are retained, there being one for each connecting rod, and with an increase of throttle

opening the troughs are raised and the supply of lubricant augmented. The oil is circulated by a gear pump. There is the usual sight feed.

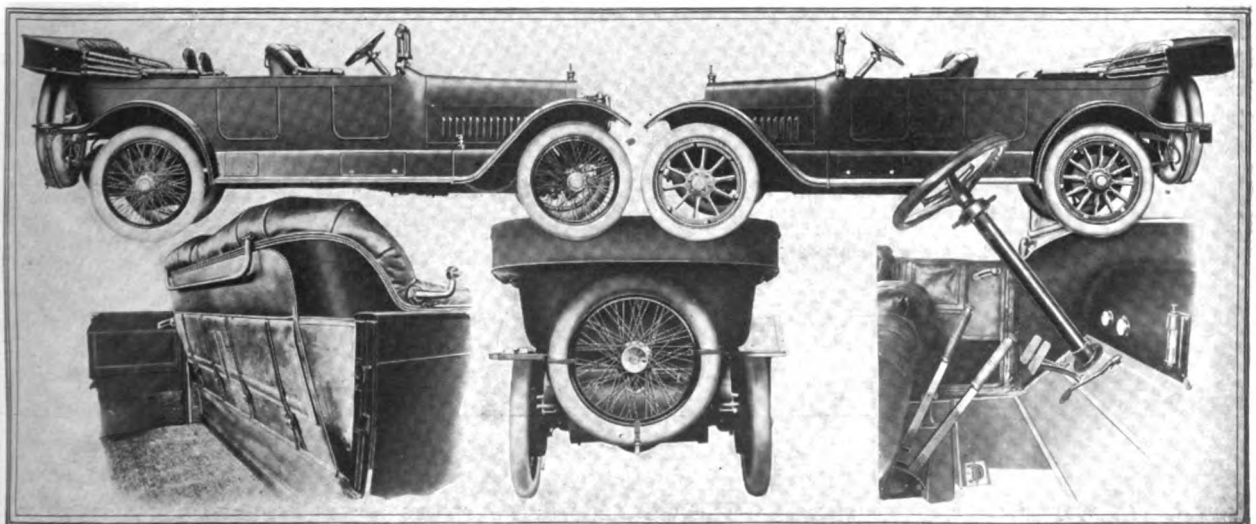
The clutch is of the multiple disc type and a three-speed gearset is employed, having ball bearings. Drive is by shaft to a full floating rear axle, the motor to axle ratio being 3.90:1. The Gray & Davis lighting and motor starting system is fitted, the motor starter operating through a reduction gearing to a sliding pinion engaging

with teeth on the periphery of the flywheel. Connection is made by a pedal operated switch. The generator is driven by silent chain from the magneto shaft.

The six-cylinder is fundamentally the same, with the exception of a four-speed gearset. Wire wheel equipment is optional. The tire sizes on the four are 36 by 4.5 inches, and 37 by five on the larger model. The running boards are particularly clean, the tool boxes being placed just over them under the front seat. In the seven-passenger models the folding type of seats is fitted, making for convenience. Large pockets are provided at the rear of the front seats of the touring models. Sloping hoods add to the attractiveness of the design. The Gray & Davis lighting and motor starting system, two separate units, is standard equipment.

### DETAILS OF 1914 STEARNS-KNIGHT.

**Four, Five, Six and Seven-Passenger Touring Bodies, Three-Passenger Roadster, Coupe, Sedan, Limousine and Landaulet.**  
**Left Hand Drive, Centre Control.**  
**Electric Lighting and Starting.**  
**Four and Six-Cylinder Chassis.**  
**Sloping Hoods on All Models.**  
**Control Board Under Wheel.**  
**Gearset on Four Amidships.**  
**Folding Type Extra Seats.**  
**Wire Wheels Optional.**



Showing Some of the Features of the 1914 Stearns-Knight Line, Which Includes Three New Body Designs.



## PROPER TREATMENT OF TIRE EQUIPMENT.

**T**HE following suggestions as to the proper treatment of tires and its effect in securing returns on the investment, are made by F. A. Henderson, manager of the adjusting department of the Goodyear Tire & Rubber Company, Akron, O.:

An automobile is pretty nearly human in one respect. It requires care to make life long, and care that it may perform its functions up to the standard of its creation. That is often entirely overlooked by the owner of the car and this negligence is certain to hasten the tire breakdown.

Any tire is subject to more or less abuse, owing to the fact that it must encounter all kinds of roads and receive little or no consideration from the driver. Cuts, stone bruises, mud blisters, etc., result, and if these are neglected they eventually spell out the destruction of the tire, as dissipation does the man.

Tire neglect runs bills up unbelievably. There are many more things for the drivers to consider than the mere driving of the car. Road conditions play an important part in the life of tires. Inflation, distribution of the weight of the machine and alignment of the wheels are also influential. No two tires in a set may give the same service, although their quality, workmanship and construction may be identical. One may give out far before its time. There is a reason for this. Do not blame the tire; always look at the real cause and place the blame where it belongs. The service and mileage of a tire depend as much on the conditions under which it is used as upon the quality of the tire itself.

Possibly three-fourths of the tires returned to the manufacturers for repairs have been ridden insufficiently inflated. Insufficient inflation is responsible to a greater extent than perhaps anything else for blow-outs and quick disintegration.

When a tire is imperfectly inflated the walls are continually bending back and forth as the car moves, with the same result as when a wire or piece of metal is bent back and forth in the hands. Heat is engendered in the threads and because of this heat, and the continued bending, the walls soon weaken and give away. In a short time they are not strong enough to support the air pressure multiplied by the weight of the car and blow-outs result. Not only that, but when a tire becomes loose, a lump or fold of rubber and fabric is formed just in front of the part in contact with the ground. This is what tire makers call "kinking." This tends to separate the plies of the fabric, or in aggravated cases, to chew up the walls of the tire, as well as that portion of the tube that happens to get caught.

Don't inflate your tires by guess. A big, thick walled tire will show little depression under a heavy load, even though the air pressure is too low for safety. One cannot tell from appearance whether or not the tires are perfectly inflated. A good gauge should be used and tires tested every day.

### Little Cut Like Bad Habit.

A little cut in a tire, like a little habit, if allowed to grow, soon gets beyond control and eventually destroys the tire. A close watch should be kept of these little cuts. They should be cleansed from sand and dirt with gasoline and then filled with cement and quick repair gum. This gum will set in a few hours, become an integral part of the tire and prevent future trouble. A very large cut after thus being treated should be vulcanized at the earliest possible moment. To ignore these casing cuts altogether is to invite sand blisters and mud-boils, which are caused by sand and dust entering the cut and working in between the tread and the fabric of the casing.

These are diseases to which tires of any type or make are subject if they are not checked soon when the symptoms appear—small cuts in the tread. Sand blisters and mud-boils are more complicated and disastrous the longer they are allowed to go. They mean simply the stripping apart of the rubber from the fabric used to reinforce it. Sand and dust enter and gradually work their way between the rubber and fabric, and the result is a sand blister or mud-bol.

Tires that have already developed all these diseases—mud-boils or sand blisters—should be sent to the repair man at once. When these blisters are cleansed out and vulcanized down, your tire is practically as good as new.

### Some Causes of Failure.

If an axle is even slightly out of true, the tire will be subjected to a grinding action, which will wear out the tread in an incredibly short length of time. If you go over a heavy bump or have an accident of any kind, have your wheels examined at once. Don't wait until the tread of your tire is worn off and then blame the tire maker.

When imbedded in rubber and not subjected to strains or weakened by bending, the fabric used to reinforce the tire will retain its strength indefinitely. As soon, however, as the rubber is removed and moisture from the road is permitted to penetrate, the fabric begins to disintegrate and in a short time its strength and resistance are gone forever.

If one tire stops the load, as is often the case when brakes are not properly adjusted, the tread is liable to be worn through to the fabric by one application of the brake. The strain of stopping the car is thrown almost entirely on one wheel. It is set and the tire is subjected to a severe grinding action with the pavement or road. See that the brakes are adjusted to equally distribute the strain. Sudden stops have the same effect and should be avoided. Skidding around corners at high speed is likewise very disastrous.

The fabric having been thus weakened it is a matter of a short time until the air pressure in the tube, increased by the weight and strain of a heavy car, becomes too great for the container or casing, and a loud report announces to the driver that the tire has suffered a blow-out. Naturally, the driver seeks the cause. If one is not patently apparent, the manufacturer is blamed for defective material or workmanship. To experts, however, the causes are well known. So long as the fabric is preserved as it was when the tire was new, the blow-out is not likely to occur. Let the tire be ridden partly or wholly deflated for a distance, or suffer a cut or stone bruise, the fabric is weakened as a result and once trouble starts it gradually becomes worse until the blow-out point is reached. Too frequently the driver finding no immediate cause, disregards entirely the remote abuses, which are the real causes of his troubles. In the case of a cut or bruise, the blow-out may not occur for days after the accident, enough of the fabric being left intact to sustain the pressure for some time.

Tire fabric is like other textiles. It tears easily once it is cut, while it resists the most severe strains when uninjured. A very small cut or rend in the fabric, may, therefore, result in a bad blow-out if not properly repaired.

### Effects of Overloading.

Pneumatic automobile tires are designed to carry loads in proportion to their cross sections and diameters. Nothing will tear tires to pieces so quickly as overloading. Many motorists who get frequent punctures and blow-outs, and who have tire troubles in general, can trace their difficulties to overloading. Tops, windshields and many other devices are considered as extras by the manufacturer and may increase the catalogue weight materially.

It is estimated that five per cent. added to the weight of the car adds 15 per cent. to the wear and tear on the tires. For this reason it is always economy to adopt tires one or two sizes larger than the regular equipment on your car. Even if the regular size tires are not overloaded, additional mileage and satisfaction to cover the additional cost will be given by larger tires.

The tremendous horsepower of some high priced machines produces an effect similar to overloading. The strain is too great for rubber and fabric to endure long uninjured.

### Use of Chains.

If chains are used they should have proper adjustment. Chains applied too tightly will cut the tread out and render the tire useless in a short time. The chains should be adjusted to allow them to shift around over the tread and the wear will be distributed.

If one-piece clincher rims are used, it is advisable to examine them at frequent intervals for dents. The clinch-



er rim is easily bent and being subject to rust the edges may become worn down to a cutting edge, then rim-cutting begins and the case is soon cut through.

When a clincher tire rim-cuts, examine the rim to see if the cause is not to be found there. Casings should be removed from the rims occasionally to allow an examination of both rims and casings, the casings for breaks and indications of breaks in the fabric, for strains show up sometimes inside first, and can be reinforced with a patch, and an ultimate blow-out may be avoided; the rims, for dents, irregularities and rust.

With clincher tires one of the costly evils is irregularity of rims. If the rim does not fit the clinch of the tire with perfect contact, the bead is soon destroyed and water is allowed to enter the tire with destroying influence.

If, when the casing is removed, the shoulder of the bead appears yellow or rusty, the rim should be thoroughly scoured with emery cloth and given a coat of aluminum paint. A rusty rim soon eats away the canvas. The tire should, of course, be thoroughly cleansed before it is again applied.

#### How Tires Should Be Stored.

Tires should not be stored or left off any length of time unused in the direct rays of the sun, or kept in very warm quarters. Under such conditions the rubber quickly loses its elasticity, becomes hard and soon develops innumerable fine cracks. A continued exposure as above will render the best tire practically valueless in a few months.

When buying a new case or a tube, it will be wise to see that the dealer has not had it displayed in the window. To secure the longest life and greatest amount of service from a tire it should be stored in dry, cool and dark quarters.

Never allow tires to stand in oil at the garage or elsewhere, and be particular to wipe off any oil which may drop on the tires at any time. Lubricating oil greatly softens the rubber, makes it pasty and glue-like in consistency and takes all the resistance and elasticity out of it. This oil may be cleaned from the tires with gasoline, as gasoline evaporates and does not result in injury.

If, when the car is idle, it is jacked up, it will add to the life of the tires, as they are then bearing only the pressure of the air with which they are inflated, whereas, when supporting the weight of the car, this weight, often several thousand pounds, is exerting a continual, unnecessary strain on the casing walls. By adopting this course it is estimated that the life of the tires will be increased by at least half the time that the car stands idle.

The motoring public is fast coming into realization of the truth of the suggestions given above and its tire troubles are growing less.

The Goodyear Tire & Rubber Company has inaugurated an educational campaign. We realize the public is not as familiar with the care of tires as it should be, and our representatives have instructions to give tire users all the time necessary in order to educate them as to their proper care of their tires. We feel sure this campaign will be of benefit to the automobile world in general.

The chamber of commerce in San Antonio, Tex., has taken steps to raise a \$5000 guarantee, pledged by the business men of the city, for an automobile race meet during the first week in November.

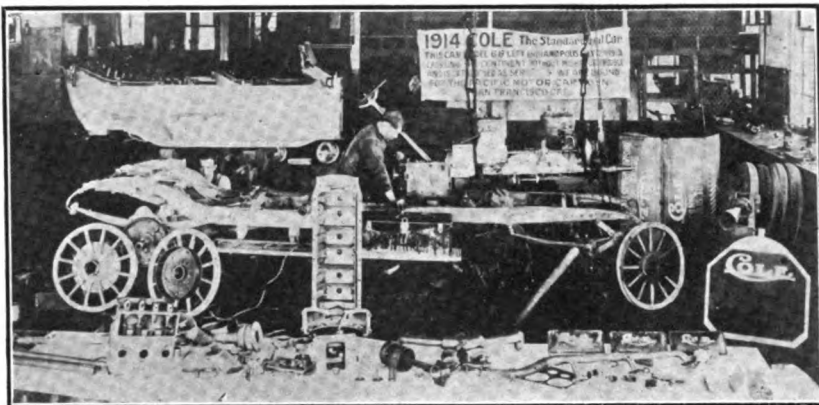
The first official display of 1914 models is being made by the dealers in St. Louis, Mo., in a show which opened in Forest Park Highlands, Oct. 6, and which will continue until Oct. 11.

## THE COLE TEST TRIP.

### Long Distance Transcontinental Tour Now Rapidly Drawing to a Close.

One of the most interesting test trips ever undertaken by a motor car manufacturer is now drawing to a close. Chief Engineer Crawford of the Cole Motor Car Company left Spokane, Wash., last week on the last leg of the journey to the factory in Indianapolis. The car is a six-cylinder 1914 Cole model. Upon its return to Indianapolis it will be subjected to another rigid inspection, similar to that which it underwent in San Francisco and which is illustrated herewith.

Mr. Crawford left Indianapolis in July, shortly after the departure of the tourists of the Indiana Automobile Manufacturers' Association, and arrived in San Francisco a few hours later than the others. Subsequently, the car was com-



Cole Engineering Test Car Dismantled in San Francisco at Completion of Transcontinental Run from Indianapolis.

pletely dismantled as shown. Then it was sent up the Pacific Coast to Portland and Spokane, encountering some of the worst grades in the country.

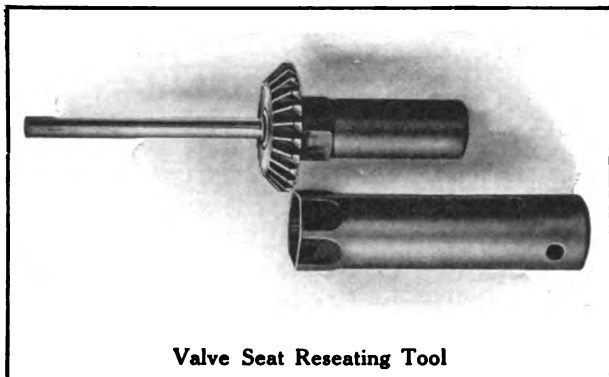
The itinerary from Spokane to Indianapolis includes a section of the country through which but few automobiles have been driven. There is much interest in the Far West—and this interest will, no doubt, extend to every section of the country—in learning just what the dismantling test at the factory will disclose.

The Attleboro Automobile Club has been organized in Attleboro, Mass., with the following officers: President, Frank Mossberg; vice president, Dr. R. P. Kent; secretary-treasurer, J. H. Vallette; directors, the above and W. J. Luther and Walter Kendall. The club has a charter membership of about 25.



## GARAGE AND REPAIR SHOP EQUIPMENT.

**L**ABOR saving devices spell economy. Any equipment that completes the work in quicker time and as satisfactorily as with the



Valve Seat Reseating Tool

older methods, is bound to attract and retain custom. These points are brought out in the announcement of the G. B. Sales Corporation, 1790 Broadway, New York City, which concern is marketing the G. B. valve tool. The company maintains that it requires about eight hours to place a badly scored set of valves in good condition again by usual methods, representing an expense of \$4.80 to the owner, and that the G. B. outfit will accomplish the same results in 30 minutes.

The equipment, which is shown in accompanying illustrations, is for reseating as well as redressing the valves, and the maker states that it will reface valves to a perfect angle of 45 degrees and may be utilized with those of any size and material. The tool is so constructed that the valve must always be on centre when it is being dressed, insuring a uniform face. The device is also serviceable when ridges, grooves, pits, etc., are to be removed and which take considerable time when ground by hand.

The G. B. tool is the invention of George C. Bouthinon, who has had considerable experience in the manufacture of motor cars, and he designed it to save time in the factory. It is of drop forged, case hardened steel, the blade and seat cutter being of high speed, oil tempered tool steel, and guaranteed against defects in material and workmanship.

To use, the tool is clamped in the vise, a bridge member opened, and the blade disengaged by loosening a lock screw. The valve is then placed in the cone section and the knurling nuts turned to equalize the distance on both end threads so that a roller bearing will be flat on the valve stem. The knurling lock nut is secured and

the bridge closed, the latter being retained by a pin member. The blade is then adjusted and locked. The valve is rotated by a dog and feed is by thumb screw. The blades and cutters are sharpened easily.

### ERICKSON HOSE CLAMP.

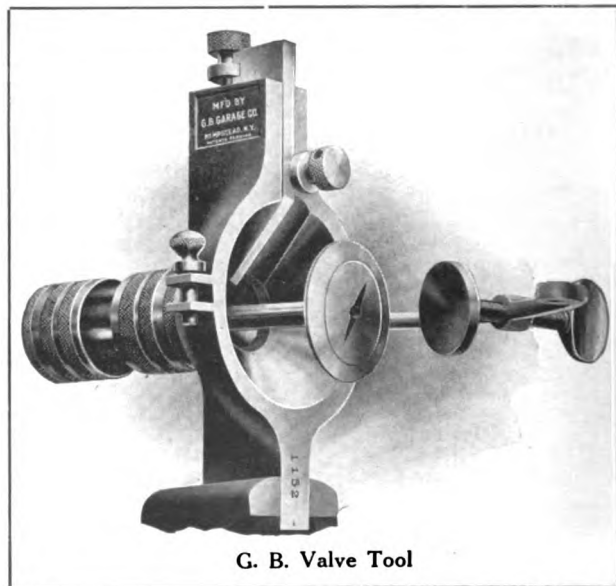
P. E. Erickson & Son, Port Chester, N. Y., is manufacturing a new type of hose clamp. One end of the band intersects the other and this with a screw adjustment permits of use with different diameter hose. The standard finish is electro-galvanized, but other finishes are provided. The sizes range from .375 to two inches.

### ATLAS BALL GAUGE.

The Atlas Ball Company, Philadelphia, is placing on the market a new ball gauge which can be utilized as a limit gauge, the ball on one end being gauged to 1.251 inches, and the other 1.249 inches. Complete details are supplied by the company, which is located at 201 Glenwood avenue.

### SPRINGFIELD CIRCLE CUTTER.

The Shawver Company, Springfield, O., is manufacturing the Springfield circle cutter, which

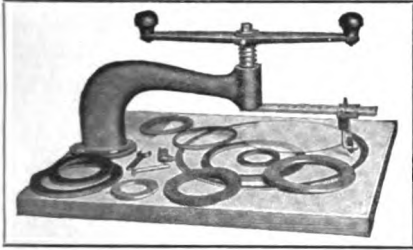


G. B. Valve Tool

is a very useful tool in the garage and repair shop, as by it gaskets may be cut to any size circles up to 14 inches. The device is provided



with a positive measuring scale, making it a simple matter to adjust the knife. The last named member will cut rubber, felt, fibre, etc.,



Springfield Circle Cutter.

and provision is made for cutting glass and sheet copper. The equipment includes a knife for square edge and bevel edge

work. The cutter weighs but 12 pounds, is constructed of high grade material, and is moderately priced. Particulars will be mailed on request.

### GLOBE AIR COMPRESSORS.

The Globe Manufacturing Company, Battle Creek, Mich., is marketing a line of air compressors with various equipments to meet the requirements of service, including portable and stationary outfits. All are of the air-cooled type and it is stated that stuffing boxes, oil cups, piston packings, etc., are eliminated, and that all working parts are fully enclosed. One of the compressors is shown in an accompanying illustration and when in operation will develop and maintain 150 pounds or more of pressure. The company also produces an automatic outfit, which keeps the tank constantly stored at a predetermined pressure. The company issues a catalogue in which are listed 20 types of compressors and each equipment is fully explained.

### MILLER STEAM VULCANIZER.

Charles E. Miller, Anderson, Ind., is marketing the Five-In-One steam vulcanizer, which has a circular surface and essential clamps for repairing eight tubes at the same time. The circular tube plate has four extensions for casings. The gas or gasoline burner is stationary, but the vulcanizer proper may be rotated as desired. Air bags are eliminated, as the outfit is operated with pad and clamp pressure.

### LINDHE SHIMS.

The Lindhe Shim Company, 212 Canal street, New York City, is marketing the Lindhe shims in two new sets. The first is known as the No. 1 and comprises one strip, .03125 by two by nine inches (all .002 inch laminations); .0625 by two

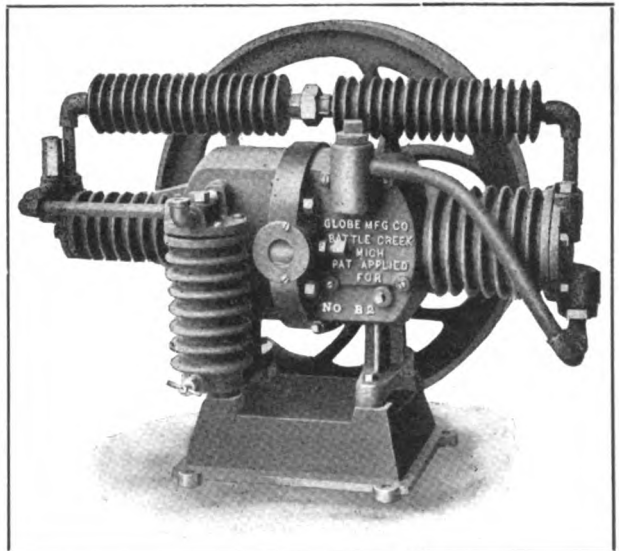
by nine inches; .125 by two by nine inches; the last two named are half .002 inch laminations and half solid brass. The second set consists of similar sizes, excepting the laminations are .003 inch. By combining these different pieces almost any thickness of shim can be obtained.

### GLYCO REINFORCED BEARING.

The Glyco bearing is being marketed by Joseph T. Ryerson & Son, Chicago, and it is claimed that by a bronze or steel reinforcement of skeleton construction the body and flange are greatly strengthened.

The Automobile Club of Vermont held its 12th annual meeting at Montpelier, Vt., recently, and elected the following officers: President, Lester H. Greene, Montpelier; vice president, E. A. Brodie, Burlington; secretary-treasurer, Smith S. Ballard, Montpelier; director, George H. Morrill, St. Johnsbury; representative in American Automobile Association, Edwin C. Smith, St. Albans. The meeting was addressed by Guy W. Bailey, secretary of state, his subject being "Automobile Laws and Good Roads."

The September number of The Haynes Pioneer, a monthly publication, devoted to the interests of the Haynes Automobile Company, Kokomo, Ind., is unusually interesting, containing as it does a description of the ignition system



Globe Air-Cooled Air Compressor Designed for Garage Service, Etc.

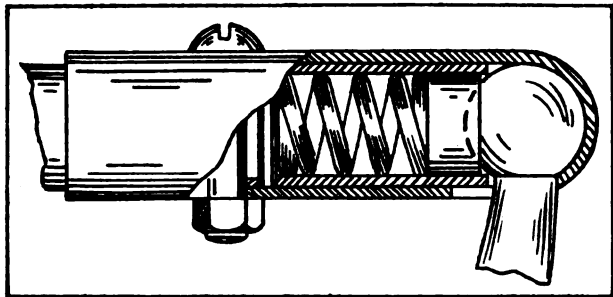
utilized on the new models. The magneto is described and illustrated, and its operation is explained.



## THE REPAIR SHOP AND THE GARAGE.

### Suggestions for a Testing Seat Having Adjustable Features and Adaptable to Various Chassis--Safety Socket for Tiebars and Drag Links.

A THOROUGH overhaul of the car is followed by testing the chassis out on the road, where the carburetor is tuned up, minor



**Duryea Safety Socket for Tiebars and Drag Links.**

adjustments, etc., being made. It is customary to attach some form of temporary seat to the chassis undergoing road test, and owing to different makes of cars it is not always easy to secure the seat. In an accompanying illustration is shown a testing seat which can be constructed at slight expense, and with very little trouble it may be adjusted to fit any chassis, and shifted to accommodate either right or left hand steer.

The top member of the seat is constructed of a suitable length and thickness of plank which is cut in two, the cut being made three or four inches from the centre as shown in the sketch. The side members or standards are of .875 or inch board and the top boards are screwed onto these. To prevent sidesway, angle irons are fitted, two to each standard.

The seat is made adjustable by boring two holes in the smaller board and cutting two slots in the larger member as shown. Two mild steel plates .25 inch thick and nine long, with width equal to that of the plank, are employed to secure the two halves, bolts passing through the plate and slots in the seat. Four bars of .5 or .625-inch round iron and about eight inches longer than the seat over all, are threaded and fitted with nuts and washers. Four holes are bored in the side standards at a suitable pitch to allow the rods, when in position, to clear the chassis frame.

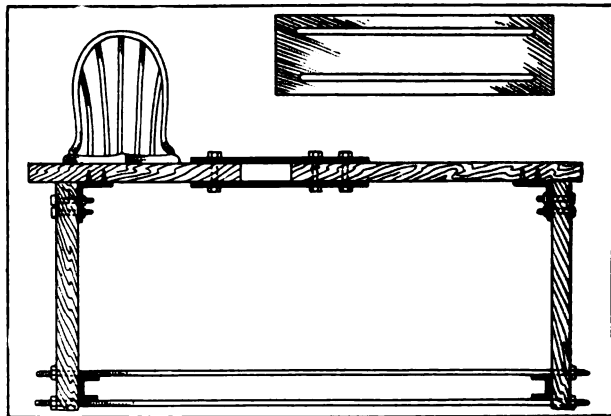
To fit the seat to a chassis, it is placed in position, the rods fitted over and under the frame as shown, and the nuts screwed up snugly. As the bolts in the plates will slide in the slot during the fitting, these members should be loose while

the seat is being placed on the chassis, but they are tightened in position after the rods are secured. By taking a chair and removing the legs, a comfortable seat may be obtained. By using four round headed bolts and drilling a like number of holes on the right and left hand ends of the large plank or seat, the chair may be used for either right or left hand drive. To prevent the standards marring the paint of the frame, leather strips can be fitted, and if the rods are screwed up tight there will be no slip to chafe the varnish.

#### DURYEA SAFETY SOCKET.

The Duryea Motor Company, Saginaw, Mich., has brought out a safety socket for tiebars and drag links and the device is not only simple in design but light. The socket is shown in an accompanying illustration and it will be noted that the main tiebar is of steel tubing, having near each end a large and small hole transversely through it. Around this tube telescopes the socket proper, also of steel tubing, but spun at one end to the form of the ball of the steering arm, this spinning leaving a small hole for oiling. Through one side of this socket is bored a hole to admit the ball, while the usual cup and anti-rattle spring are applied near the end of the main tiebar tube.

The parts are assembled by a special clamp



**An Inexpensive Testing Seat Adjustable to Any Chassis and Quickly Attached.**

which compresses the spring when the parts are in place and permits of inserting the single bolt, which binds the parts together, a pin having been



placed across the main tube to act as an abutment for the spring. The maker points out that the construction is moderately priced, that it is so designed that the end of the main tube comes almost against the ball, and that the breaking of the spring does not permit the socket to get off the ball of the steering arm.

### LOCK NUT SUGGESTION.

A driver makes the following suggestion for eliminating cotter pins and preventing nuts from working loose on the spring clips, brake drums, etc.: Make a saw cut in the bolt, screw up the nut, then spread the bolt with a chisel.

### CASE HARDENING HINT.

In case hardening, where the work must be uniformly hard all over, the usual treatment is satisfactory, but when only the wearing surfaces are to be hardened and other parts left soft for machining, etc., a different process will be required. Ordinary fire clay is sometimes used, but it tends to crack or peel during the heating, exposing some of the surface, which is not desired.

It is suggested by an experienced mechanic that a solution of copper be used on the parts desired to be left soft, in that less than one-hundredths of an inch in thickness of the copper will resist the action of any hardening compound. If plating vats are not convenient, a strong solution of sulphate of copper may be utilized.

### ECONOMY WITH KISSELKARS.

#### Chicago Owners Testify to Low Cost of Upkeep for Two Years' Service.

W. S. Trescott, manager of the Moneyweight Scale Company, Chicago, believes he is justified in boasting of the service rendered by his 40 horsepower KisselKar, made by the Kissel Motor Car Company, Hartford, Wis. He has driven this machine an average of 2000 miles a month since April 1, 1912, and has experienced no mechanical trouble. He reports that he gets 15 to 18 miles to a gallon of fuel.

Another Chicago owner, who is not adverse to expressing his opinion in public is F. J. Heidler of the Fink-Heidler Lumber Company, who has a 1911 KisselKar 6-60. He declares that his total repair bill for the second year of service was \$2.50. "It is the most economical car I ever saw," is the manner in which he expresses his convictions.

### ANOTHER NATIONAL RECORD.

#### New England Owner Claims to Have Reduced New York to Boston Mark.

The National Motor Vehicle Company, Indianapolis, Ind., is resting upon its laurels, insofar as racing is concerned, having secured the national, international and world's stock car championships, which have not as yet been wrested from it, although the marks were set almost two years ago. For this reason National cars have not been seen in racing events this year, except in such isolated instances as individual owners have seen fit to make entry.

It would appear, therefore, that National cars had little more to secure in the way of records, but Richard G. Badger and his brother, Hard G. Badger of Boston, recently notified the factory that they had reduced the cross country record between New York City and Boston to 6:15:00, elapsed time, the actual running time being 5:45:00. The trip was made with entire absence of tire trouble and without any inconveniences.

### TO DISTRIBUTE COLE CARS.

#### Prominent Boston Men Form Company to Handle Sales in That District.

It became known recently that H. J. Habich of the G. E. & H. J. Habich Company, Boston, Mass., distributor for Cole cars, made by the Cole Motor Car Company, Indianapolis, Ind., was to retire from the concern. It now appears that the Cole Motor Car Company of Boston is to be formed to take over the sale of this product in eastern Massachusetts.

The new concern is financed by two retired capitalists of Boston, William Hickox and Grant C. Smith, and at least a portion of the old Habich company will be retained in the organization. G. E. Habich is to be in charge of the sales department, and Conrad Smith, son of Grant C. Smith, who was in the old company's sales department, will continue in that position. Edward Linehan will retain the direction of the service department.

In the future the Cole will be displayed in a handsomely appointed showroom at 94 Massachusetts avenue, and the big service station of the company will be maintained at 53 Bickerstaff street.

T. H. McGiehan, for the past year general manager of the Motz Tire & Rubber Company, Akron, O., has been elected vice president.



# CHARACTERISTICS OF HEAVY FUELS.

## Part IV--Effects of Varying Temperature of Compression upon the Fuel, and Causes of Internal Condensation--Factors Making for Smoky Exhaust.

**I**N THE last issue the operation of an automobile engine supplied with heavy fuel and controlled by a throttle was discussed, and some of the results obtained were outlined. The conclusions drawn by R. Owen Allsop as to the causes of trouble are given herein, and the article is supplemented by remarks by another prominent authority on heavy fuels and carburetion. Both are important in that they advance reasons for the lack of successful heavy fuel carburetors and explain some of the difficulties attendant upon the use of kerosene as a fuel in the automobile engine.

### Internal Condensation.

The lowered compression curve is thermodynamic loss and in the variable speed oil engine it has been shown that it is accompanied by imperfect performance of the engine cycle. In considering the effect of internal condensation, it has been pointed out that it indicated that

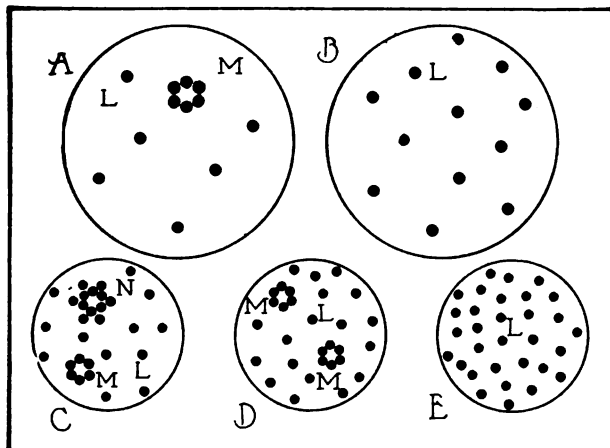


Fig. 20—Illustrating Hypothetical Action Concerning Heat of Compression and Condensation in the Engine Charge.

varied load resulting in varied speed sets up conditions affecting feed and concerning vaporization as reacting on the condition of such feed, and at times, it was shown, that variable temperature of the vaporizer surfaces must be taken into account, and that it is the chief reactive effect attendant upon varied load as such.

The slow speed overloaded, and the slow speed free engine—both must suffer from internal condensation phenomena, for plainly, if the charge condition is suitable for high compression, that is, suitable under this condition, to provide petroleum fuel in a fit state for combustion, should the temperature of compression be varied, as the result of varied throttle valve position, that which is not converted into vapor by adiabatic compression, remains or persists as a liquid. In other words, if the heat of compression falls, the amount of combustible in fit state for combustion is reduced, and the engine having a wet vapor feed commences to knock, indicating pre-ignition, itself sufficient to show that howsoever good the mixture of air and combustible, liquid fuel pertains in the charge at the culmination of compression. The question naturally arises, if the liquid fuel, as such, present at the end of the charging stroke, is not vaporized by

adiabatic compression, what becomes of, and what happens to it?

### Effects of Compression Stroke.

It is often assumed that air compression with the accumulated heat of such compression, always acts to vaporize petroleum, and this may be assumed to be so under certain conditions. The compression stroke of the four-stroke cycle for oil engines must be esteemed of high value, but powerful for good if under control. It may also prove to be a bad master, causing coalescence of oil globules and casting these on the cylinder walls, spreading practically a layer of fuel upon the lubrication film. In the case of the hypothetical engines, the overload caused disorganization, it being held to be due to the coarsening of the feed and the lowering of the temperature of compression. The same condition was noted when the clutch was engaged and the piston speed of the engine fell. It was also decided that the act of varying compression, originating in engines from throttling, caused varied temperatures of compression. As a main result from this it was held that the amount of combustible would vary as the temperature of compression.

### Factor of Condensation.

It therefore becomes necessary to inquire if an approximately constant amount of feed an engine induction stroke is fed into a cylinder, and of this so much is combustible, what becomes of the residue or balance, which is not in a fit state of combustion? It certainly goes into the cylinder and must come out at some time or other, or there would be a rapid accumulation, either of oil or oil decomposition. And it may be stated that stationary oil engines have been made and commercially exploited wherein the lubricant of the piston was designedly by condensed petroleum. Condensation of the fuel fed into oil engines is a long recognized phenomenon, but the subject has generally been considered only as affecting running and thermal efficiency. If engines can be lubricated with condensation from the fuel, such condensation must be more or less existent in all oil engines when the vapor is sufficiently wet to render the action possible.

From the moment when the overload commences to bring down engine speed, petroleum as liquid begins to fall upon the cylinder walls so that, when the clutch is disengaged, there acts not only the factor of spray degeneration and the weakening of the charge, but also a throwing out of condensed fuel which, being re-evaporated during the combustion and exhaust strokes, must lead to increased visible exhaust, and which, but for the insulating and cleansing effect of the lubricating film, would under the method of evaporation unquestionably foul the cylinders and bring about sticky piston troubles. Variable load engines, coupled with varying piston speed, set up difficulties relating to feed, directly by spraying variations, and indirectly by matters concerning compression and internal condensation. Viewing the nature of petroleum as compared with gasoline, the one condensable, the other volatile, the trouble that accrues may be comprehended if feed is characterized by liquid spray where pure vapor intimately mixed with air should be the condition.

### Heat of Compression.

In a high state of carburetion, the result of fine pulverization projected without delay straight onto highly heated vaporizing surfaces, coupled with adequate means of introducing extra air, such air not being merely introduced, but caused to disseminate among the finely divided fuel, the compression stroke acts, no doubt, to complete that feed preparation that commenced externally to the engine. Varying piston speed here tells less heavily against good combustion results. A fine point may be involved respecting whether vaporization or condensation may result from compression, but it seems possible that even when all work of air compression is converted into heat, large oil globules may not vaporize, but may be caused to coalesce one with another. If this be true, then it would tend to show that effective and con-



stant atomization has benefits that are two-fold; on the one hand there results a superior state of engine charge; on the other, internal cylinder condensation troubles are alleviated. Again, where the condition of running includes variable spray formation—now fine, now coarse—the evils are also two-fold, for not only is the charge impoverished, but it also suffers from effects of varying compression absent, or not nearly so pronounced, under a refined condition of carburetion.

The diagram at Fig. 20 may usefully illustrate hypothetical action concerning heat of compression, and condensation in the engine charge. The parts of vapor are represented by L and M as a particle of hydrocarbon fuel existing as liquid. In the diagram A there are six parts of vapor, and a condensation containing a further six parts of vapor. If it be assumed that diagram A represents the conditions in the cylinder at the end of the charging stroke, a hot compression may result in the condition indicated at B. Heat of compression has vaporized the condensation, there being now 12 parts of vapor. Generally, the idea here put diagrammatically shows the value of compression heat in oil engines, for, but for this internal heat, many engines would be useless. Assuming that such action takes place rhythmically, all goes well—that is to say, at constant load and speed, with constant feed and mixture; every compression stroke gives a constant amount of the fuel combustible, while wall action, if a deformation in the cycle, is at least consistent.

#### Causes of Smoky Exhaust.

Now, if high temperature of compression changes state A to state B—as when the engine runs fast with open throttle—if the throttle be closed and the speed fall, it may be assumed that the state A may persist more or less during and up to the completion of the compression stroke. Therefore, it is assumed that the compression changes from hot to cold and cold to hot; at one time perfect combustion will be obtained, at another smoky exhaust, and this in spite of constant feed. In changing from A to B, the combustible in a state fitted for combustion is doubled in amount, the completely vaporized charge B having 12 parts vapor. If the particle M is of sufficient size and gravity to resist compression heat and the blast of combustion, it will be cast out in the exhaust in a dense vaporous condition which renders the action and results visible to the eye. The diagrams C, D and E enlarge the hypothetical action, for N is assumed to be a denser condensation than M—a heavier particle of fuel spray. A condition may now be conceived of an engine running in which, although the feed may be absolutely constant as to quality, amount and proportion, and assumed to exist at the end of the compression stroke made under certain conditions of pressure and temperature as state D, the charge on ignition will vary at times, and be on different occasions as indicated at C, D and E. In C, D or E are shown 24 parts of combustible vapor. Such conditions may conceivably bear some relation to the three compression curves A, B and C in Fig. 19.

If there is enough combustible vapor present to give an effective explosion in an oil engine, it might be possible to augment the feed in the form of heavy spray without bringing the machine to a standstill, often without greatly upsetting the action, but necessarily with great volumes of smoky exhaust and heavy condensation on the cylinder walls. This cannot be done with gasoline because of its volatile nature, as the mixture is enriched until it becomes practically non-ignitable.

#### Fineness of Spray a Factor.

It is generally supposed that the heat of compression converts oil spray into vapor, but where such statements are made there should be added: If the spray is sufficiently fine and if there be sufficient air in the charge. If it be assumed that diagram E represents, not mixture, but vapor solely, compression will bring about states D and C; that is, it will condense vapor to liquid so that, as previously suggested, not only is the result of compression on the oil engine charge dependent on pressure and temperature, but also on the amount of air present.

Oil spray may persist as an individual agglomeration of hydrocarbon through the whole ordeal of compression and combustion. High temperature in the cylinder with low pressure favors vaporization most, so that high speed in a throttled engine may be as effective as a high degree of compression heat with low speed. Fundamentally the premises are sound, but the whole action is somewhat obscure at the point of critical temperature and pressure, where a substance may exist either as a liquid or vapor.

A high state of carburetion is the only protection against the evils resultant from varying compression and varying piston speed, for by very thorough mixing of air in very thoroughly vaporized fuel, each particle of combustible has an aerial envelope apparently acting to prevent aggregation of the individual units composing the charge. It is noteworthy that the non-spraying, direct vaporizing system of fuel treatment is prone to encourage deposits in engines, and it may be assumed that the trouble arises from stratification—massing of fuel into vapor clouds which become more or less liquid during compression. The old practise of squirting gasoline into the inlet of the engine was highly productive of sooting, and must be deemed a parallel in its effects with the stratification to which allusion has been made.

To add air to petroleum directly vaporized from heated surfaces, in such manner that perfect carburetion may result, is difficult. The spraying method shown at Fig. 21, suggesting stratified vapor, difficult to aerate, and air, as indicated by arrows forcing its way into sprayed fuel, suggests at once an effective method of commencing the process of carburetion, for in direct vaporization the air must force its way among the particles naturally desiring to aggregate. It seems strange that the oil engine having a coarse feed does not foul, whereas the highly efficient vaporization of direct vaporizing methods tends this way. The presence of liquid fuel in excess seems, by maintaining a constantly flooded state, to prevent deposition of carbon, so that the engine action is satisfactory and the conditions in a sense cleanly, although the exhaust is always dense.

#### Control and Visible Exhaust.

The act of control of a motor car kerosene engine, whether from load or for speed, brings into play many

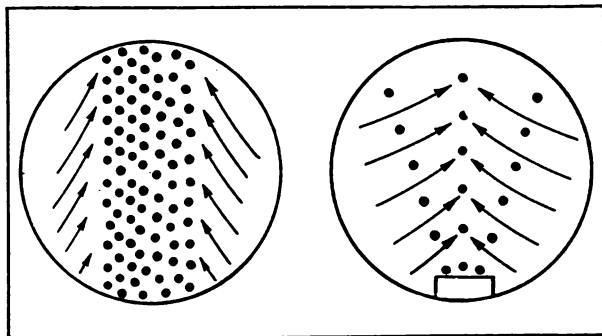


Fig. 21—Suggesting Stratified Vapor, Difficult to Aerate, and Air, as Indicated by Arrows Forcing Its Way into Sprayed Fuel.

peculiar actions attendant upon combustion within cold cylinder walls that create visible exhaust, which may or may not be coincident with internal trouble from fouling of the engine parts. It is by no means certain that the smoking oil engine is causing trouble internally. Often the reverse is indicated, for of all fouling processes none is more insidious than vaporization direct; that is, without the intervention of preliminary spraying, and it always needs be noted that fine spray includes high aeration. If the fuel be vaporized directly, vaporization as such may be effective, but into this mass of vapor air must be introduced and to cause perfect intermingling. It has, therefore, always appeared to the writer that preliminary spraying is fundamentally a preferable principle for oil engines that are intended for variable load and variable speed, and that this principle is good whether as to a detachable carburetor or as to an integral heavy oil engine.

Thus far the origin of smoke from the motor has been traced to several causes, all coincident so far as determining that the cause is liquid fuel in an engine charge that should be gaseous. The immediate factors bringing about the trouble have been investigated and prominent among these has been found degeneration in spray, or in other words, that the fuel is not at times under all conditions, properly broken up. Whether the liquid particles originate at the sprayer, or whether they are produced by causes acting inside the cylinder, the effect of their presence institutes visible exhaust. The various considerations entered into should remind the



engine designer how important the matter of water cooling is in imperfect oil motors.

#### Value of Hot Jacket.

As a very general rule the oil engine having a wet vapor feed runs best with a hot jacket. From what has been discussed respecting the sensitiveness to temperature of the oil engine charge, it can be seen that the total amount of fuel held up in the cylinder in a fit state for effective and smokeless combustion can be greatly modified by water jacket temperature. The essential difference between cylinder charges of spirit and heavy fuel engines is that the former is stable and the latter extremely sensitive to temperature conditions. The only way to bring about improvement in the latter is by insuring true vapor perfectly intermingled with air. Irregular mixing must be deemed a great evil, for whatsoever may be the effect of compression upon mixture, the compression of true vapor necessarily condenses that vapor, so that, while small vapor clouds, or stratification, occur, the vapor will be converted by compression into liquid fuel globules, or at the best a state of equilibrium may be occasioned—neither vaporization nor condensation. It is the air that usefully serves as a medium whereby compression can be accomplished, retaining heat represented by work done.

It is worthy of careful note that the trouble with oil motors is greatly aggravated by the prevalent fashion of throttle control. An engine running with fixed gas as fuel is well suited for the method of throttle control, the gasoline engine in a less measure; for every one of the points herein detailed applies, on a greatly reduced scale, to normal gasoline engines, of which the designers are only now beginning to realize that the earlier carburetors suffered from crude spraying and want of devices for controlling spraying. Atomizing jets are only today being recognized as necessary, if gasoline is to be economized and the smell of the overloaded gasoline engine mitigated. The throttle is a simple and convenient method of control with the gasoline engine, but in oil engines it originates evils only to be combated by producing a less sensitive charge.

The above might lead the casual reader to the conclusion that the combustion of kerosene is a practical impossibility insofar as the obtaining of satisfactory all around results is concerned, but it should be remembered that the article deals mainly with the use of kerosene by what might be termed the suction spray carburetor method. Robert W. A. Brewer, an English authority on carburetion and fuels, states such a method of utilizing kerosene for internal combustion engines which are subjected to large variations of load and speed, is not to be recommended. He says:

#### Kerosene a Practical Fuel.

From the distant past up to the present time a long train of inventors has endeavored, with almost universal failure, to feed an internal combustion engine of the high speed type by means of a suction operated instrument, and the difficulties in connection with such an apparatus have proved so disheartening that one after the other of these various kerosene carburetors have disappeared from the public view. Generally the first claim that is made for an instrument of this type is that it will start from cold, but the experience of the writer has been that wherever a kerosene carburetor has been submitted with this claim it has failed to justify the statements of its inventor.

On the face of it, we may say that in the ordinary way it is an impossibility with our present knowledge to start a kerosene carburetor without the addition of any sort of heat whatsoever, by reason of the fact that kerosene can only be made to burn otherwise under conditions of very fine spraying. If we could so design spray producers, which could be fitted into the combustion heads of the cylinders comprising an ordinary automobile motor, and if these spray producing apparatus could be

so finely adjusted that they injected only sufficient fuel for complete combustion, there is no doubt that a spray type of kerosene carburetion could be produced. However, one does not see any means by which such an ideal state could be put into practical application, and one must come to the conclusion that the suction operated spray type or the pressure fed spray type, without the assistance of some external heating device, can be ruled out of court.

#### Carbureting Kerosene.

Mr. Allsop points out that the question of variable speed is seldom mentioned. This is the principal factor causing difficulty in connection with the carburetion of kerosene, and this is a fact when one considers solely the suction operated type of instrument, but variable speed of engine does not necessarily mean that the gas speed varies, for we know that the modern development in carburetor practice has led to the more constant gas speed type of instrument which controls the speed of the gas through the carburetor, and by which we are more likely to obtain satisfactory carburetion under all engine demands. For instance: If an engine is running under light load it is necessary to concentrate the air flow around the fuel orifice and keep up the speed of the air so that satisfactory atomization can take place. On the other hand, if the demand increases to its utter limit of power the speed should not be allowed to rise abnormally and impair the output of the engine.

There is another point in connection with the article which refers principally to those types of instruments which are simply and solely throttle controlled, and it is shown that the amount of the charge has to be varied in order to govern the engine, and presumably the composition of the charge is kept more or less within constant limits. Although the explosive limits between which one can use kerosene are somewhat narrowed down as compared with the more volatile fuels, yet there is no doubt that it is possible to run a kerosene operated engine on mixtures of varying strength, and in passing the writer would like to draw attention to the fact that under light loads the compression can be maintained to a much higher point than one might anticipate, by weakening the strength of the charge. The writer has discovered in actual practice that there is some advantage to be gained by keeping the compression up; that is, by keeping the throttle open and running on a weak mixture, and it would appear that the desired high temperature of the cylinder walls can be more easily maintained through periods of light loading by carrying such a theory into actual practice.

#### Limit of Temperature.

Without going into definite figures of vaporizer temperature it would be well to bear in mind several points which are of practical value in this connection. There is, undoubtedly, a well defined limit of temperature which is most suitable for the purpose of vaporization, as when the temperature of the vaporizer is below this value, if sufficient vaporization occurs thereon, the heavier particles of fuel are left behind. On the other hand, if the vaporizer temperature is too high, kerosene as a liquid never comes in contact with the hot surfaces, but each globule is at once surrounded by a sheath of its own vapor, which prevents the liquid coming into actual contact, and effectually prevents vaporization of the liquid itself. A ready example of this state of affairs can be obtained if one endeavors to place water upon a heated surface the temperature of which is sufficiently high to cause a sheath of steam to be formed around each drop. The drops then will not touch the surface and will become dissipated slowly. It has been discovered in actual practice that this upper limit of temperature has been most marked, and that it has been quite impossible to run an engine when the vaporizer has become too hot.

Considerations of vaporizer temperature are therefore of great moment when designing their dimensions and weight. As the temperature rises and falls fairly readily with the heat supplied, it is therefore preferable to utilize some form which has a thermal storage of considerable capacity, as by such means, and such only, can vaporizer temperature be kept uniform and within reasonable limits.

#### Precipitation of Fuels.

If we can so design the radiating surfaces that the abstraction of heat by the fuel on its evaporation shall be practically equal to the transference of heat from the exhaust gases to the vaporizer itself, and that the thermal capacity shall be sufficient to allow the engine to run



light for such a period as might be met in ordinary practice, we shall have a vaporizer of a type suitable to overcome many of the difficulties pointed out in Mr. Allsop's article. He also points out that one of the greatest difficulties in connection with the utilization of kerosene is the precipitation upon the walls of the cylinder, or on the external surfaces of the induction pipe. This is the greatest difficulty we have to contend against, as, although one can conveniently produce a vapor of a very fine texture in a suitable apparatus, if one attempts to convey this moist vapor through tortuous passages, precipitation is bound to occur. The principal object, therefore, to be aimed at is the production of a gas at a low temperature, which is so fixed that upon coming in contact with cool surfaces there is no precipitation or condensation, and the vapor must retain its character throughout from the vaporizer to the inside of the engine cylinders.

Many of the difficulties, therefore, in connection with the utilization of kerosene disappear if we can produce such a vapor in a suitable apparatus, and in order to obtain the maximum volumetric efficiency, this vapor should be dry and at a reasonably low temperature. Furthermore, the vapor should remain at the same density from one moment to another under all conditions of working, and if such a vapor can be produced, we have simply the problem of the gas engine over again—that is, that of proportioning the amount of vapor to air to give the most satisfactory results.

### INCREASES CAPITAL STOCK.

#### Henderson Motor Car Company Adds \$200,000 and Three New Directors.

The Henderson Motor Car Company, Indianapolis, Ind., maker of the Henderson car, which has been offering the Harroun kerosene carburetor as optional equipment during the past season, has increased its capital by the addition of \$200,000 worth of stock. It is also announced that three prominent Indianapolis business men have been added to the directorate, these being Franklin Vonnegut, Arthur R. Baxter and A. R. Smith.

While no definite announcement has been made public, it is rumored in Indianapolis manufacturing circles that the company is to market a car to sell at a lower price and that an effort will be made to produce a line of kerosene burning machines.

### NEW MOTORING ASSOCIATION.

#### Organization to Provide Protection for Its Members While on the Road.

The American Motorists' Protective Association has been formed under the incorporation laws of New Jersey, which would seem to be all that its name implies. It aims to provide members with a certificate of credit reference to be used for identification or emergency credit at hotels, garages, etc.; with prompt attention, consideration and care in case of sudden disability or trouble while touring, this including legal and medical assistance; with special arrangements

with manufacturers, supply houses and garages to secure supplies, accessories and service at the lowest prices, and with indemnification from loss in whole or in part for money or necessities furnished fellow members when away from home.

The last paragraph of the prospectus deals with the detection, pursuit, apprehension, arrest or prosecution of motor car thieves, and the recovery of stolen automobiles. The association expects to create a legal and detective department, which will cover this feature in its entirety, and to provide members with special motorist's accident insurance. A department of chemical and mechanical investigation is to determine the merits of preparations, lubricants and mechanical attachments or devices offered to motorists.

### IMPORTS AND EXPORTS.

#### Former Decreased 50 Per Cent. in Value, While Latter Held Their Own.

The report of the bureau of foreign and domestic commerce, Department of Commerce, Washington, D. C., for the month of July, shows that 37 automobiles, valued at \$81,678, were imported into the United States this year as compared with 64 cars, valued at \$155,251, during the same month in 1912. The imports are not divided as to pleasure and commercial cars, but the report of exports shows 44 commercial cars, valued at \$103,612, and 1720 pleasure cars, valued at \$1,632,641, this year as compared with 78 commercial cars, valued at \$156,458, and 1557 pleasure cars, valued at \$1,546,179, last year. The total value of imports for the month shows a decrease of nearly 50 per cent., while the exports a little more than held their own. The tabulation according to countries follows:

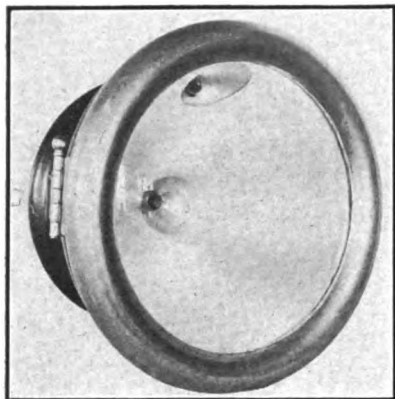
|                         |      | Imports.    |      |             |  |
|-------------------------|------|-------------|------|-------------|--|
|                         |      | 1912        |      | 1913        |  |
| Country                 | No.  | Value       | No   | Value       |  |
| France .....            | 36   | \$95,433    | 16   | \$34,085    |  |
| Germany .....           | 6    | 18,063      | 6    | 13,880      |  |
| Italy .....             | 6    | 11,111      | 3    | 6,831       |  |
| United Kingdom .....    | 5    | 8,810       | 3    | 11,817      |  |
| Other countries .....   | 11   | 21,834      | 9    | 15,065      |  |
| Totals.....             | 64   | \$155,251   | 37   | \$81,678    |  |
|                         |      | Exports.    |      |             |  |
| Country                 | No.  | Value       | No   | Value       |  |
| France .....            | 36   | \$31,843    | 47   | \$33,281    |  |
| Germany .....           | 22   | 21,188      | 132  | 98,420      |  |
| Italy .....             | 36   | 26,795      | 39   | 31,932      |  |
| United Kingdom .....    | 345  | 230,924     | 300  | 232,792     |  |
| Other Europe .....      | 147  | 124,672     | 166  | 148,275     |  |
| Canada .....            | 462  | 686,889     | 207  | 348,174     |  |
| Mexico .....            | 9    | 14,683      | 30   | 39,487      |  |
| West Indies and Bermuda | 13   | 12,166      | 35   | 33,170      |  |
| South America .....     | 180  | 198,798     | 222  | 247,544     |  |
| British Oceania .....   | 209  | 184,034     | 277  | 240,734     |  |
| Asia and other Oceania  | 133  | 124,086     | 154  | 144,472     |  |
| Other countries.....    | 43   | 46,559      | 155  | 137,972     |  |
| Totals.....             | 1635 | \$1,702,637 | 1764 | \$1,736,253 |  |



### NEW DOUBLE-BULB LIGHT.

#### Guide Lamp Company Brings Out Special Headlight Having Interesting Features.

A new type of electric headlight which presents interesting and practical features is announced by the



Guide Double-Bulb Headlight.

Guide Motor Lamp Manufacturing Company, Cleveland, O., a well known maker of automobile lamps. The special de luxe headlight, as it is called, is provided with two bulbs, one a large 16 candlepower member, located and operated in the conventional manner, and a smaller lamp. The latter is of two candlepower, and the semi-reflector, which is a part of the large parabola, is so constructed that the rays of the small bulb are thrown downward. This eliminates all glaring effects, conforms to the motor car light regulations in New York City, Chicago and other cities, and provides sufficient light for operating purposes.

The special de luxe has a 12-inch front with nickelled rim, black japanned body, Guide true parabolic reflector, and a curve or swell plate glass front. The same high grade material and workmanship for which the product of the company is noted is incorporated. Double wiring is employed. The design not only makes for economy of current in that the side lights may be eliminated, but it will appeal to motorists who desire to equip their machines with electric lighting. The Guide Motor Lamp Manufacturing Company is now located in its new factory, the facilities of which will enable the concern to produce the Guide line in considerably larger quantities.

### SERVICE WITH THE MOON.

#### Chicago Man Runs His Car 30,000 Miles at a Total Repair Expense of 17 Cents.

Half a cent for each 1000 miles of service is the repair record of a 30 horsepower Moon car

as reported to the maker, the Moon Motor Car Company, St. Louis, Mo., by S. M. Perrigo of Chicago. He says he drove his machine 30,000 miles, and the total amount he expended in repairs was 17 cents. "And I didn't need to spend that," he explains, "only I preferred a different style of oil cup." He now owns a 48 horsepower Moon, which he has driven over 4000 miles.

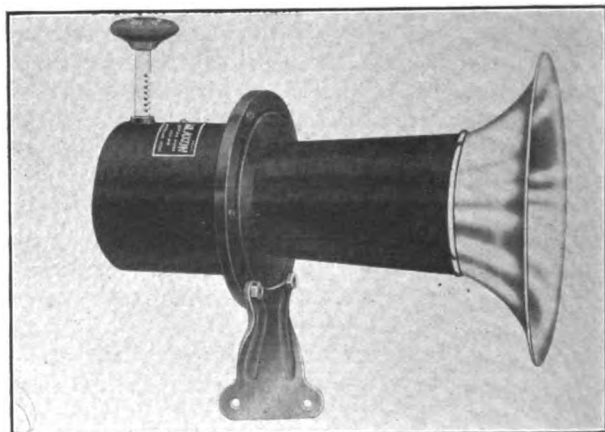
### ANOTHER KLAXON HORN.

#### Is Operated by Hand and Has Similar Note to Well Known Signal.

The Lovell-McConnell Manufacturing Company, Newark, N. J., maker of the well known Klaxon horn, announces a new signal which is manually operated. It is not entirely new, however, being a development of the original hand Klaxon, which was manufactured in 1909, and since then gradually discontinued, owing to the enormous demand for Klaxons operated by electricity.

The new member of the family is operated on the Klaxon principle of a vanadium steel diaphragm vibrated by a rotor or ratchet wheel. In the case of the electric horn this ratchet wheel is rotated by an electric motor; in the new horn, by a train of gears that attain a high speed under pressure on the pushrod. The hand signal has a true Klaxon note and is sold under the Klaxon guarantee of permanent satisfaction. The signal is moderately priced.

Orders will be accepted Nov. 1 and deliver-



Showing the Latest Member of the Klaxon Family, a Hand Operated Horn, Embodying Klaxon Principles.

ies will begin Dec. 1. The same high grade material and workmanship characteristic of the products of the Lovell-McConnell Manufacturing Company are incorporated in the new product.



## IN THE COMMERCIAL VEHICLE FIELD.

### Knox-Martin Tractor Is Being Utilized to Solve the Garbage Disposal Problem-- American Trucks Prove Superiority Over Foreign Design in Philippines.

**W**ITHIN the past few months the subject of garbage disposal, and the relation of the motor vehicle thereto, has been given consideration by a large number of American cities. The engineers of the Knox Automobile Company, Springfield, Mass., have been assisting some of these municipalities in experimenting with Knox-Martin tractors for this work.

In the Knox plan the horse carts collect the garbage from house to house, but instead of making the long, hard haul to the refuse plant, which usually is located in the outskirts of the city, each team draws its loaded wagon to a convenient junction point, where the body is jacked up at the forward end. The king pin is removed and the team with the forward axle is attached to an empty wagon, which has been jacked similarly and is in waiting. During the night, or any other convenient season, the tractor picks up these loaded wagons and hauls them to the refuse plant.

An additional advantage in this method is found in the fact that the wagons being covered, there is no objection concerning the odor and no dropping of particles of garbage, as is necessary where the load must be transferred from one vehicle to another, which is sometimes done to avoid the long haul with horses. It is also pointed out that there is considerable saving in economy, since one tractor can do the work usually done by several horses.

#### CLEANS OUT CATCH BASINS.

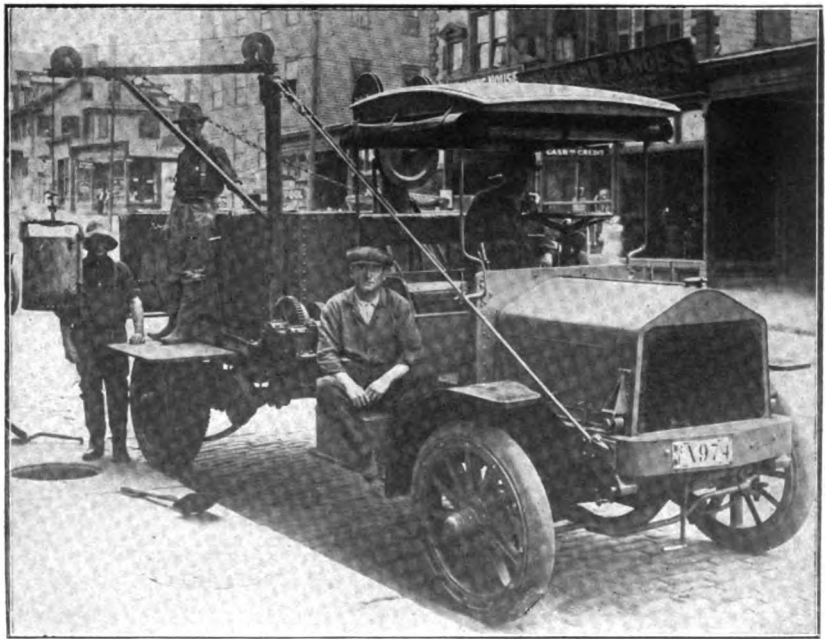
#### Standard Truck Does Work of Six Teams and 12 Men in This Service.

Commissioner Gill of the department of public works in Pawtucket, R. I., has devised a plan whereby a three-ton Standard truck, made by the Standard Motor Truck Company, Detroit, does the work of six horse carts and 12 men in clean-

ing out the catch basins of the city. Not more than three men are required to work the truck and accomplish the same results.

The chassis does not differ materially from that regularly supplied by the maker. The body was built by the Monahan Vehicle Company, Providence, R. I., and the mechanical details of the additional equipment were worked out by James Nesbit, who is in charge of the motor apparatus utilized by the department.

The entire outfit is designed to lower buckets into the sewer basin, there to be filled and then hoisted and dumped into the body of the vehicle.

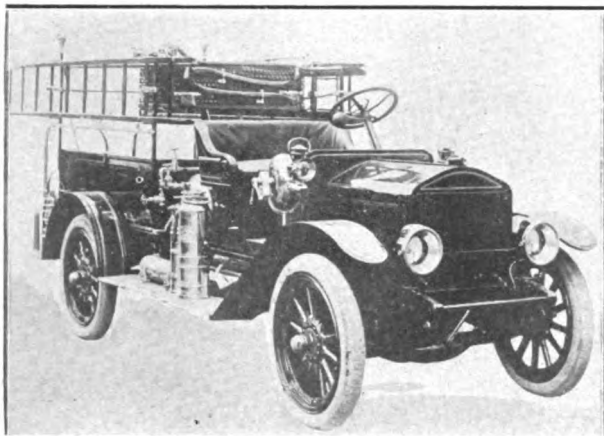


Standard Three-Ton Chassis Fitted with Special Body for Cleaning Sewer Catch Basins.

When the latter is filled the machine is arranged to dump the entire load in 40 seconds, so that there is a material saving in time, as well as labor.

Directly back of the driver's seat is a two horsepower single-cylinder auxiliary engine, geared to a hoisting drum from which a cable is run through the centre of the crane and over pulleys on the arm. This engine draws its fuel supply from the same source as the regular motor which propels the truck, and the exhaust is arranged to communicate with the muffler. The water circulation is connected with the radiator





**Brown Combination Chemical Engine and Hose Wagon.**

so that the two engines utilize practically the same system. At the front of the body is an hydraulic hoist for dumping the load, this comprising a long cylinder with a piston forced upward by oil from a gear pump, which is driven by a connection in the transmission case.

#### **GLASS ROOFED MOTOR 'BUS.**

##### **Interesting Body Designed for Service Over Route of Paul Revere's Ride.**

The John Rockett Taxicab Company, Boston, Mass., has recently placed in service an interesting vehicle which will be operated as a sight-seeing 'bus over the route followed by Paul Revere on his memorable ride. The chassis is a standard 3000-pound White, made by the White Company, Cleveland, O., and the body was constructed to the specifications of the Boston concern.

The rear considerably overhangs the chassis frame and the interior is made to accommodate 22 passengers, the seats being arranged with an aisle between each except that at the back. There is but one entrance, this being at the right side, near the driver, and the entire machine is controlled from the inside. The driver is located at the left, and the steps are so

arranged that he may raise or lower them as required.

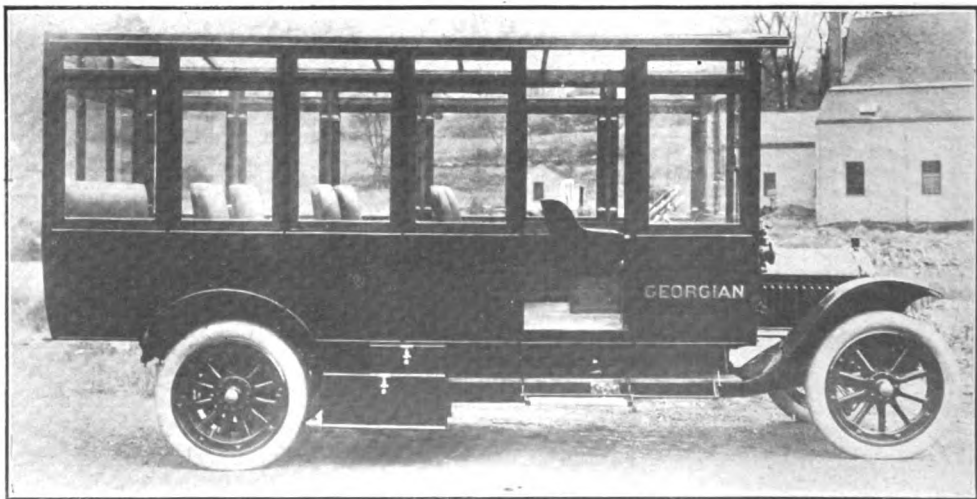
The body is surrounded by windows and the roof is also of glass, so that there is abundance of light and full opportunity for observation, no matter what the weather conditions may be. The roof is of so-called fireproof construction, being reinforced with wire, so that in the event of accident there could be no damage or injury from breakage. The side windows are removable, and when removed are carried in a compartment beneath the chassis frame.

#### **BROWN FIRE WAGON.**

##### **Particularly Well Adapted for Service in Smaller Cities and Towns.**

Those who are interested in the matter of securing fire protection in the smaller cities and towns, where the funds available are such that it is not deemed advisable to change any substantial proportion of the equipment from horse drawn to motor driven, cannot help but appreciate the advantages presented in the new Brown fire wagon, produced by the Brown Commercial Car Company, Peru, Ind. The vehicle is illustrated herewith and is a combination chemical engine and hose wagon, mounted on a light weight chassis.

The design and equipment is such that it is expected to take care of incipient blazes before they have reached serious proportions. The weight is an important factor in this connection, making it possible to cover a wide area from a central station, for instance, in quick time, bringing to the scene of the fire sufficient men and the character of apparatus needed to check the spread



**White 3000-Pound Chassis Fitted with Glass Roofed Sight-Seeing Body Designed for Service Around Boston.**



of flames or extinguish the blaze before the arrival of the slower going equipment. This is expected to make its appeal to the smaller cities and towns, although these advantages are such as to apply in any community.

### PEERLESS TRUCK IN PHILIPPINES.

#### Superiority to Foreign Machines Proven by United States Army Tests.

Because of the existing transportation facilities in the Philippine Islands, the United States Army has felt the need of relying upon motor vehicles for the distribution of supplies and materials from the headquarters of the department in Manila. Some little time since, a number of specially built French machines were purchased for this service, these being rated at two tons.

It was explained at the time that these cars were acquired because no American vehicles were available for such work. Naturally, this position was felt somewhat keenly by American manufacturers, and as a result of negotiations, the military officials were induced to give a three-ton Peerless truck, made by the Peerless Motor Car Company, Cleveland, O., a test under similar conditions to those obtaining with the French product.

The truck was assigned the duty of climbing Benguet hill, an exceedingly steep ascent, with varying loads. It consumed less fuel with three and four-ton loads than did the French two-ton machines. With all but the largest loads the truck was never operated on the low speed, and it did not heat excessively, though only two makes of touring cars have ever climbed the hill without stalling because of overheated motors. On one run with a load of 6340 pounds the truck made the distance in 3:20:00, which was faster than the train schedule.

It is not surprising, in view of these results, that the government purchased the only two Peerless trucks in stock in Manila, and negotiated for several others. The power of a truck that would carry an overload up a hill that no other machine had climbed with a full load, appears to have demonstrated sufficiently the quality of American machines, and probably has ended a demand by the army for foreign trucks for service in the Philippines.

Earl Jackson, in a Reo, made by the Reo Motor Car Company, Lansing, Mich., recently defeated a field of six in a free-for-all road race between Virginia, Reno and Carson City, Nev. It is stated that the winning car already has covered



**Peerless Three-Ton Truck Which Underwent Successful Competition Test with French Machines in Philippines.**

35,162 miles in the service of the Western Pipe & Steel Company, over all sorts of roads in the San Joaquin valley, California.

A Cartercar, made by the Cartercar Company, Pontiac, Mich., driven by Fred Pentecost of the Washington Cartercar Company, finished the recent Post-Intelligencer tour in Seattle, Wash., with a perfect score. This is the first contest of any kind in which this make of machine has appeared in the Northwest.

Louis Noel, piloting a 120 horsepower Grahame-White biplane, established a new world's record for duration of 19:47, with nine passengers at the Hendon flying field, Oct. 2.



## IN THE REALM OF THE MOTORCYCLIST.

### President Patterson Acted Legally in Declining to Issue Brooklyn Call—Bcsch Trophy Award to Be Decided in Chicago—Racing and Club News.

**I**N REPLY to a request that he give his views concerning the refusal of President Patterson of the Federation of American Motorcyclists, to call a meeting of the national assembly in connection with the proposed celebration of the organization's birthday in Brooklyn, N. Y., last month, Director W. M. Johnson of Chicago, who is a lawyer, has prepared a lengthy document setting forth that not only did the president's action have the approval of nearly every member of the board

been "to complete the unfinished business of the convention held in July, 1913, and to consider other matters", the latter not being specified. It further appears that the unfinished business of the July convention had already been referred by that convention to the board of directors. Among the other points raised by Mr. Johnson are the following:

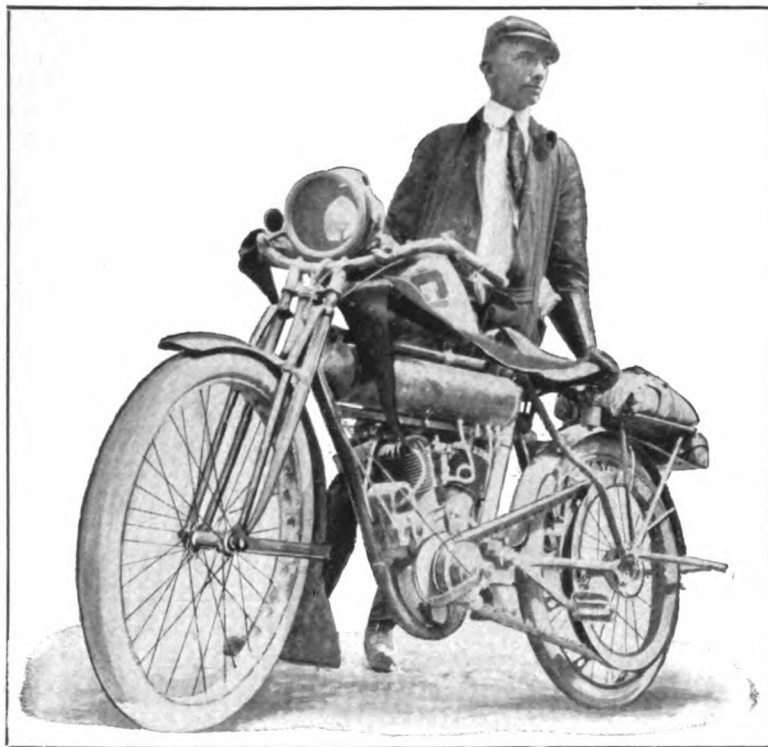
The constitution is the fundamental law of the body and is adopted by the members. The bylaws are rules and regulations, for the orderly and convenient transaction of its affairs, enacted by the directors, always, however, subject to the organic law and limitations laid down by the constitution. Where unauthorized by the constitution, such bylaws are of no binding force upon anyone. No greater rights can be conferred upon the members by the bylaws than are conferred by the constitution. By article 2 of the constitution, the annual meeting must be called by the board of directors. By article 6, it is provided that the constitution may be amended, at a special meeting of the assembly called for that purpose. These are the only constitutional provisions, by force of which meetings of the national body are or may be called. In view of the widely scattered membership and the financial and other considerations, in their nature opposed to frequent meetings of the assembly, it is evident that these provisions were inserted intentionally, and with the manifest purpose to limit the meetings to annual sessions, the directors to care for its affairs meantime.

Even under this bylaw the petition could not in fairness be granted. The objects and purposes as a whole were not such as could be considered at a special meeting of the assembly. By the constitution the only subject that could be considered was an amendment to the constitution. Taking advantage of the fact that no notice of such meeting was expressly required, the petitioners filed the petition with the president, Aug. 9, 1913, and set the time so that notice in the motorcycle journals of 30 days could not be given. This is the shortest notice mentioned, and is the method designated, wherever the question of notice arises, by the constitution or bylaws. The petition assumed to fix the date and place of the proposed meeting. These matters are solely

within the discretion of the president, even under this bylaw.

#### Recent F. A. M. News.

The board of directors of the Federation of American Motorcyclists has voted that after Oct. 1 the secretary-treasurer shall keep a record of the receipts for memberships and renewals, placing to the credit of all properly organized states, 25 cents of each new member and renewal money fee, said sums to be drawn upon by the proper state commissioner with the O. K. of his district



**Fred Karl, Canal Dover, O., and Flying Merkel He Has Ridden Nearly 40,000 Miles.**

of directors, but was perfectly right and proper when viewed as to its strict legality. Those who are seeking to compel the resignation of President Patterson claim that he violated article 9, section 8 of the bylaws, which reads as follows:

The president shall call a special meeting of the national assembly upon the written request of any 25 members, said request to state the object or objects of such meeting.

It appears from Director Johnson's brief that the object of the proposed meeting was to have





A. P. Madison, Lynn, Mass., and His Pope.

vice president; the different state apportionment moneys to remain in the hands of the national treasurer until drawn upon.

In relation to the recent court hearing in the District of Columbia, regarding the tandem law, the F. A. M. contributed \$50 during the earlier court proceedings, and although asked

for \$50 more on the appealed case, did not feel it could place a larger sum in any one locality. At the hearing just completed, in which the motorcyclists were successful, the F. A. M., through Director French, had a great deal to do with the conclusion of the case, which is looked upon as a good precedent.

The Federation Internationale des Clubs Motorcyclists, of which the F. A. M. is one of the 11 components, will have a conference in Paris, France, Oct. 25. It is expected that the American organization will be represented by a member residing in London, England.

President Patterson has appointed F. W. Sullivan, 420 South Winnebago street, Rockford, Ill., as state commissioner, and reappointed R. S. Pascal, 270 South Sixth street, Newark, N. J., in the same capacity. Local commissioners have been appointed by State Commissioner Campbell of Ohio as follows: Lorain, C. B. Tunte, 539 Broadway; Kent, M. E. Ellis, 107 Portage street; Bedford, Herbert Myers; Lucas county, A. G. Weiler, 145 Michigan street, Toledo; Calion, A. B. Diamond, Public square; Chagrin Falls, William Zoul; Laura, William Strickler; Mt. Gilead, C. W. Ewers.

Clubs have recently affiliated with the federation as follows: Norwich, Conn., C. V. Pendleton, Jr., 35 Broadway, 14 members (reaffiliation); San Angelo, Tex., Noah Smith, 320 South Oaks street, 15; Manitowoc County, Manitowac, Wis., L. F. Wagner, 32.

The following new registered repair shops have been announced: Fred E. Field, 44 Bridge

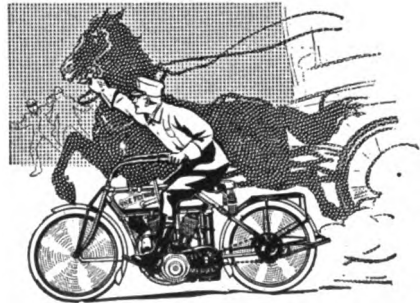
street, Catskill, N. Y.; Huter & Bishop, 107 St. Paul street, Dallas, Tex.; Joseph Candioto Company, 151 North Broadway, Lexington, Ky.

#### Flying Merkel Economy.

Fred Karl of Canal Dover, O., whose picture is shown herewith, purchased this six horsepower Flying Merkel, made by the Miami Cycle & Manufacturing Company, Middletown, O., in 1911. Since that time he has ridden it 39,890 miles, a record of which both he and the manufacturer may well be proud. Mr. Karl reports that his only mechanical expense has been \$1.50 for two new intake valves. His first belt lasted him a little over 13,000 miles. The second belt is still on the machine. His tire record to date consists of three new rear tires and two on the front.

#### The Bosch Trophy Award.

In view of the attention which has been drawn to the fact that the Bosch trophy, offered annually by the Bosch Magneto Company, New York, to be competed for in connection with the national amateur championship races of the F. A. M., has not been awarded this year because of the failure to run off the 50-mile event, the only remaining contest of the series, John L. Donovan, 819 Ashland block, Chicago, chairman of the F. A. M. competition committee, announces that he has issued a sanction for this race to the



## ALWAYS READY FOR ANY EMERGENCY!

With its ability to pick up speed quickly—(60 miles an hour from a standing start within a city block)—the 1913 Flying Merkel Motorcycle is always ready for instantaneous use. These features and the fact that the Flying Merkel Motorcycle is the most economical in the world to operate has led to its universal adoption by Police Departments, Park Boards, Gas Companies, Telephone and Electric Light Companies and all other business concerns and individuals whose requirements demand a sturdy, reliable motorcycle at the minimum cost of upkeep. Remember, the Flying Merkel

"Made Its Name on Merkel Mileage."

Free Art Catalog on Request.

## The Miami Cycle & Mfg. Co.

320 Hanover St.

Middletown, Ohio, U. S. A.



North Shore Motorcycle Club, Chicago, Ill., to be run on the Hawthorne track, Nov. 2.

#### Cross Country Sidecar Trip.

Among the recent visitors to the factory of the Hendee Manufacturing Company, Springfield, Mass., maker of the Indian, were Mr. and Mrs. H. J. Tucker, Akron, O., who were on their way to Boston and return, a distance of 1900 miles, on an Indian with sidecar attachment.

Others who have paid their respects lately under similar conditions are Mr. and Mrs. Corson, Baltimore, Md., who were on their honeymoon; W. E. Cornell, Los Angeles, Cal.; Robert Stubbs, Birmingham, Ala.; Walter Goerke, Newark, N. J.; H. M. Kipp, Toronto, Can.; Earl O. Myhill, Medina, N. H.; J. W. Brown, Trotville, N. C., and W. H. Hells, London, England.

#### Harley-Davidson Man Weds.

Announcement is made from Milwaukee,

orado and Minnesota, three each; California, Nebraska and Oklahoma, two each; Maine, New Hampshire, New Jersey, Alabama and Kentucky, one each.

#### Hendee Company Reorganized.

At a meeting of the stockholders of the Hendee Manufacturing Company, Springfield, Mass., maker of Indian machines, Oct. 7, the assets were transferred to a new company to be known as Hendee Manufacturing Company, and the old concern passed out of existence. The new concern is capitalized for \$12,500,000, representing an increase of \$10,000,000, which is the amount of common stock, the remaining \$2,500,000 being preferred.

#### Convention of Merkel Managers.

An accompanying illustration presents a number of district managers, who attended the recent semi-annual convention at the factory of the Miami Cycle & Manufacturing Company, Middletown, O. After inspecting the new models of the Flying Merkel, the visitors were taken on an automobile ride by President K. R. Jacoby and Secretary J. W. Ash to the new branch factory in Indianapolis, Ind. Standing from left to right in the picture are the following: F. P. Lee, western district; Weston Kent Thomas, eastern district No. 1; William McKinley Sheets, eastern district No. 2; J. W. Ash, secretary; John Henry Newberry, central northern district; C. A. Van Doren, New England; K. R. Jacoby, president, and R. W. Sayre, Los Angeles jobber. They were



Merkel Officials and District Managers at Recent Convention in Middletown.

Wis., that Edward J. Mueller, office manager of the Harley-Davidson Motor Company, and president of the Milwaukee Motorcycle Club, slipped out of town Sept. 10 and was quietly married. Mr. and Mrs. Mueller were somewhere near Fort Wayne, Ind., when the remainder of the Harley-Davidson force became aware of what had transpired.

#### New Members in September.

Secretary-Treasurer G. B. Gibson of the Federation of American Motorcyclists announces that 314 new members were added to the list during the month of September, and that the last card issued during the month was numbered 24,849. The additions, according to states, follows:

New York, 51; Ohio, 30; Wisconsin, 29; Pennsylvania, 21; Illinois, 19; Texas, 19; Kansas, 18; Connecticut, 16; Oregon, 12; Massachusetts, 10; Indiana, nine; Maryland, eight; Montana, seven; Missouri, seven; District of Columbia, six; Rhode Island, six; Michigan, six; South Dakota, five; Tennessee, Florida and Iowa, four each; Col-

all satisfied the prospects for 1914 were bright.

#### Popes, Not Thors.

In connection with a story concerning a foreign trip, recently completed by Stanley F. Withe and Walter McKim, in the issue of The Automobile Journal for Sept. 25, it was stated that the machines ridden were Thors. It transpires that this information was incorrect, as the young men rode 1913 Pope twins.

#### Recent Racing Results.

The following summaries indicate the results in recent race meets throughout the country:

##### Toronto, Can.

Three miles, novice—First, Armstrong, Excelsior; second, Bowden, Indian; third, Hands, Indian; time, 4:11.

Three miles, professional—First, Gardiner, Excelsior; second, Jones, Merkel; third, McIntosh, Indian; time, 3:42.2.

Ten miles, amateur—First, Duff, Indian; second, Hadley, Indian; third, Armstrong, Excelsior; time, 13:10.

Ten miles, professional—First, Jones, Merkel; second, McIntosh, Indian; third, Gardiner, Excelsior; time, 12:20.6.



Three miles, amateur—First, Duff, Indian; second, Murray, Indian; third, Armstrong, Excelsior; time, 4:19.6.

Five miles, amateur, championship—First, Murray, Indian; second, Hadley, Indian; third, Friend, Indian; time, 6:34.2.

Fifteen miles, professional—First, Gardiner, Excelsior; second, Jones, Merkel; third, McIntosh, Indian; time, 18:37.6.

#### Rock Island, Ill.

Five miles, free-for-all—First, Stickney, Merkel; second, House, Thor; time, 7:00.

Five miles, stock—First, Schieb, Excelsior; second, Stickney, Merkel; third, Sarginson, Merkel; time, 6:47.

Three miles, free-for-all—First, Stickney, Merkel; second, Schieb, Excelsior; third, Williamson, Merkel; time, 4:00.

#### Lowell, O.

Three miles, professional—First, Snyder, Merkel; second, Williams, Indian; third, Wells, Indian; time, 4:41.2.

Five miles, professional—First, Williams, Indian; second, Snyder, Merkel; third, Wells, Indian; time, 5:58.2.

#### Coldwater, Mich.

Three miles, singles—First, Miller, Excelsior; second, Abrams, Excelsior; third, Cook, Excelsior; time, 5:06.

Five miles, twins—First, Hatch, Dayton; second, Woodward, Excelsior; time, 7:09.

Five miles, twins—First, Bailey, Excelsior; second, Titus, Excelsior; third, Ogden, Indian; time, 7:17.

Five miles, singles—First, Miller, Excelsior; second, Wheeler, Pope; third, Abrams, Excelsior; time, 8:20.

Two miles, novelty—First, Bailey, Excelsior; second, Randall, Excelsior; third, Titus, Excelsior; time, 3:22.

Seven miles, twins—First, Titus, Excelsior; second, Ogden, Indian; time, 10:20.2.

Ten miles, twins—First, Doolittle, Excelsior; second, Woodward, Excelsior; time, 15:25.

#### Zanesville, O.

Three miles—First, Williams, Indian; second, Snyder, Merkel; third, Ponti, Indian; time, 4:48.6.

Five miles—First, Williams, Indian; second, Snyder, Merkel; third, Ponti, Indian; time, 6:26.4.

Three miles, miss-and-out—First, Snyder, Merkel; second, Evans, Indian; third, Ponti, Indian; time, 3:49.6.

Ten miles—First, Evans, Indian; second, Williams, Indian; third, Ponti, Indian; time, 12:58.6.

Five miles, pursuit—First, Evans, Indian; second, Snyder, Merkel; third, Amos, Merkel; time, 5:29.2.

#### Indianapolis, Ind.

Ten miles, handicap—First, Baker, Indian; second, Hoffstatter, Excelsior; third, Ellis, Indian; time, 9:35.

Five miles, side cars—First, Merz, De Luxe; second, Ellis, Indian; third, Milner, Indian; time, 7:24.

One hundred miles, open—First, Baker, Indian; second, Birkenbach, Thor; third, Shaffer, Excelsior; time, 1:37:07.2.

#### Marion, Ind.

One hundred miles—First, Rowe, Thor; second, Hagen, Harley-Davidson; third, Thompson, Indian; time, 2:28:45.

#### Club Notes, Here and There.

The Savannah Motorcycle Club, Savannah, Ga., is arranging a 300-mile race for Christmas Day over the 12-mile Grand Prize automobile course. The committee in charge consists of O. A. Meyer, Frank T. Laird, Martin Schroeder, W. S. Carraway and J. S. Balmer.

Three hill climbing events were run off by the Providence Motorcycle Club, Providence, R. I., Sept. 28, with the following results: Free-for-all—First, J. C. Garand; second, C. Anderson; third, E. G. Luber. Four horsepower machines—First, Sam Litterio; second, A. Houle; third, F. H. Williams. Seven horsepower—First, J. C. Garand; second, J. G. Edwards; third, C. A. Anderson. With the exception of Williams, all rode Indians. His mount was a Harley-Davidson. The Triangle run has been postponed to Oct. 12 on account of rain.

The Toledo Motorcycle Club, Toledo, O., held an endurance run, Oct. 4-5, the schedule including Lima, Dayton, Bowling Green, Findlay, Sidney, Springfield, Columbus, Marion and Fostoria.

Several Connecticut riders assembled at Rockville last month and took action looking toward a state race meet at Norwich during October.

The Niagara Falls Motorcycle Club, Niagara Falls, N. Y., which was organized in June, now has a membership of 64, and plans to erect a club house in which to enter-

tain motorcycle tourists visiting that section. The officers are: President, Homer Cumberland; vice president, Albert A. Weinkie; secretary-treasurer, Joseph A. Mackenna; captain, William J. Coleman.

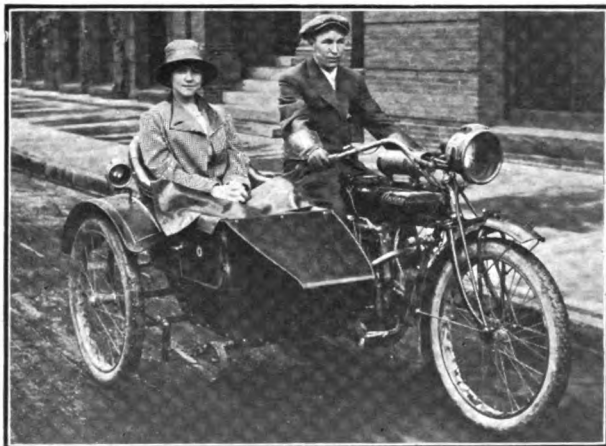
The Worcester Motorcycle Club, Worcester, Mass., held its annual banquet Sept. 24, covers being laid for 33. During the evening prizes were awarded to those holding the highest scores in the 24-hour endurance run in June.

The New Britain Motorcycle Club, New Britain, Conn., has plans for a theatre party and banquet in the near future.

Thirteen members of the Greenfield Motorcycle Club, Greenfield, Ind., recently took a trip to the southern part of the state, visiting Indianapolis, Bloomington, Nashville, Columbus, Edinburg and Shelbyville.

Members of the Buffalo Motorcycle Club, Buffalo, N. Y., recently entertained visiting riders from the clubs in Malta, Lockport and Niagara Falls.

The Harley-Davidson Motorcycle Club of Philadelphia has elected the following officers: President, George



Mr. and Mrs. H. J. Tucker, Akron, O., and Their Cross Country Indian Equipment.

O'Malley; vice president, Howard Kolp; secretary-treasurer, Lockwood Campbell; recording secretary, Armon Gruel; captain, John Selfert; first lieutenant, John Hiltelbe; second lieutenant, E. Crook; directors at large, Julius Klein and Alexander Klein.

The Garden City Wheelmen of San Jose, Cal., which has existed for 27 years as a bicycling organization, has changed its name to the Garden City Wheelmen & Motorcycle Club.

Thirty-one out of 32 starters finished in the recent 125-mile run of the Maryland Motorcycle Club of Baltimore, Md. The nine prizes were awarded in the following order: Lewis Franklin, Harley-Davidson; Walter Trappe, Harley-Davidson; Walter Fairley, Harley-Davidson; C. C. Cason, Indian; Clayton Sandruck, Flying Merkel; P. E. Ibe, Indian; L. H. Gilpin, Eagle; Gus Heinz, Harley-Davidson; Frank Fertita, Yale; H. Shipley, Indian.

### JOIN THE F. A. M.

which is the National Organization fostering the interests of motorcyclists along legislative and other lines. Cut this out, mail it, and you will get the reasons.

#### E. M. ESTABROOK

Chairman Membership Committee Federation  
American Motorcyclists,  
BANGOR, MAINE.

Please send me the F. A. M. Booklet and all information interesting to prospective members.

Name .....

Address .....



# NEWS OF THE MANUFACTURER AND DEALER.

The following concerns have been incorporated recently to manufacture and deal in motor cars, accessories, etc.:

**Allen & Cleaveland Motor Company**, Los Angeles, Cal.; \$3,500,000; S. T. Allen, G. A. Cleaveland, Jr., J. H. Crube, J. M. McDonald.

**Automobile Realization Company**, Chicago, \$90,000; to deal in automobiles and accessories; A. B. Johnston, G. B. Smith, G. F. Matthis.

**Auto Salvage Company**, Kansas City, Mo.; \$12,000; Claude S. Peck, Bessie G. Peck, W. R. Chamberlain.

**A. V. Specialty Company**, Suffolk, Va.; to manufacture and sell Nurney auxiliary air valve; A. C. Nurney and others.

**Bowling Green Rubber Company**, Bowling Green, O.; \$25,000; to manufacture tires; C. W. Greene, M. L. Cope, C. P. Cope, Loren Campbell, Mont Clouse.

**Cash Automobile Company**, Darlington, S. C.; \$1000; C. C. Vaughn, G. B. Brasington, J. B. Blackwell.

**C. A. Chambers Company**, Indianapolis, Ind.; to deal in motor trucks.

**Cincinnati-Velle Motor Sales Company**, Cincinnati, O.; \$5000; W. S. Schmidt, C. B. Groesbeck, J. J. Fauth, Elmer Strategus, J. J. Grogan.

**Caldwell Garage & Machine Shop**, Caldwell, N. Y.; \$25,000; F. W. Klein and others.

**Columb Tyres Import Company**, New York City; \$50,000; H. Ray Paige, A. C. Kahler; 1789 Broadway.

**Moon Sales Company**, Bridgeport, Conn.; \$15,000; Barnith Sachs, Henry H. Drucker, Samuel B. Drucker.

**Motor Shop**, 636-640 East State street, Trenton, N. J.; \$25,000; Robert C. Manning, Jr., Joseph L. Bodine, Walter S. Cox, Jr.

**Motor Transportation Company**, 62 South street, Morristown, N. J.; \$20,000; to operate motor vehicles from Morristown to Madison; Edward P. Guerin, Jared T. Little and others.

**Mutual Taxicab Company**, Pittsburg, Penn.; \$10,000; Antonio Floecker, C. E. Meyer, M. J. Dain.

**New Jersey Sales Company**, Newark, N. J.; \$10,000; to do a general automobile business; Robert M. Olyphant, Jr.; Charles E. Macker, Rupert W. K. Anderson.

**Pacific Motor Coach Company**, Los Angeles, Cal.; \$500,000; T. Y. Drake, W. H. Bradrick, J. L. Stone, A. B. Miner, L. D. Collings, C. O. Bacon.

**Pontiac Motor Car Company**, Pontiac, Ill.; \$25,000; I. A. Morrison, C. F. Taylor, E. Hoobler.

**Portland Auto Specialties Company**, Portland, Me.; \$5000; Frederick M. Smith, Anna T. Graham, Frank H. Purinton.

**Premier Auto Novelty Manufacturing Company**, New York City; \$15,000; automobile accessories; Harry G. Kosch, Hyman Cohen, Charles Welland; 194 Riverside drive.

**Princess Cyclecar Company**, Detroit, \$200,000; Isaac N. White, Herbert H. Dawson and others.

**Staunton Automobile Livery & Transfer Company**, Staunton, Va.; \$25,000; president, N. C. Williams; secretary, T. M. Hoopes.

**Stewart Transportation Company**, Perth Amboy, N. J.; \$2000; Walter K. Whitaker, Raymond S. Meyers and others.

**Taylor Auto Auxiliary Spring Company**, Los Angeles, Cal.; \$10,000; C. F. De Shields, J. R. Tooley, H. H. Bailey.

**Texas Motor Truck Company**, San Antonio, Tex.; \$10,000; William H. Smith, Marvin Trice, S. Burg.

**United States Garages**, New York City; \$500; J. H. Herman, Jr., H. D. Bristol, Rose Simon.

**Paul Wargny & Co.**, Chicago; \$2500; to deal in automobiles, etc.; Gustav Mueller, Paul Wargny, Sidney B. Meyer.

**Wilmont Automobile Company**, Minneapolis, Minn.; \$10,000; to conduct a garage and repair shop.

**Wilson Engineering Company**, Buffalo, N. Y.; \$20,000; C. G. Hulbert, W. F. Gagnon, W. H. Pfeiffer.

**Zin Cyclecar Company**, Rock Island, Ill.; \$25,000; factory, Davenport, Ia.

## GARAGE AND DEALER.

**The Nichols Tire & Rubber Company**, recently incorporated in New York City, has become eastern distributor

for Knight tires, made by the Knight Tire & Rubber Company, Canton, O.

**The Andrews-Dykeman Company**, Boston, Mass., has established itself in a new salesroom and service station at 43 Warren avenue.

**The Auto Distributors Company**, Logansport, Ind., agent for Cole and Paige cars, has moved to 310 Broadway.

**The Cartecar Wisconsin Company**, Milwaukee, Wis., has removed from 222 Fourth street to a new fireproof garage at 2713 Grand avenue.

**A. L. Fordan**, manager of the California Auto & Supply Company, Santa Barbara, Cal., and agent for Studebaker cars, has taken the garage at Hollywood, Cal.

**The Goodyear Tire & Rubber Company's** branch in Indianapolis, Ind., is soon to remove to a new building on North Capitol avenue.

**The Keeton Motor Car Company**, Chicago, has taken a lease of the premises at 2025 Michigan avenue.

**J. W. Leavitt & Co.**, Seattle, Wash., distributor for Overland cars and Gramm trucks, has opened its new garage at 11th avenue and East Pike street.

**The La France Garage Company**, Elmira, N. Y., is located temporarily at 251-257 West Water street, pending the completion of its new building at Baldwin and Church streets.

**The Motor Parts Company**, Boston, Mass., has opened a branch at 143 Chestnut street, Springfield, Mass. The concern has the New England distributing agency for Bosch magnetos.

**The Eugene Polk Motor Car Company**, successor to the J. T. Lloyd Company, as distributor for White and Studebaker cars in Arkansas, has located in new salesrooms at Fourth and Center street, Little Rock.

**The St. Louis KlaseiKar Company**, St. Louis, Mo., has leased the building at 304 North 12th street and will locate there.

**The J. T. Stubbs Company**, Providence, R. I., agent for Henderson and National cars, has taken the entire building at 70 Mathewson street.

**The Velvet Company**, recently incorporated in New York City, will handle the distribution of Velvet shock absorbers and operate a service station for that city and vicinity. Headquarters have been opened at 74th street and Broadway. The officers are: President, H. O. Proctor; secretary, A. H. Miller; treasurer, W. D. Ramsburgh.

**The Whitten-Gilmore Company**, after having been located at 907 Boylston street, Boston, Mass., since 1907, has removed to a new building at 620 Commonwealth avenue.

**Ray Wilmouth**, River Falls, Wis., has opened a repair shop in F. M. Ulrich's garage on Main street.

**The Breen Motor Company**, Winnipeg, Man., has contracted for \$500,000 worth of Studebaker cars for distribution during 1914 in Manitoba and other sections of the Canadian Northwest.

**The Edisto Automobile & Machinery Company** has been organized in Orangeburg, S. C., to handle automobiles and operate a general repair shop. The concern will erect a brick building, 50 by 150 feet, on West Rutland street.

**Clinton B. Lamson**, formerly connected with the Flint Oil Company, Providence, R. I., has associated himself with C. F. Drake under the firm name of the Lamson Oil & Supply Company, located at Broadway and Fountain street. The concern will carry a full line of Apco Ford specialties and Vacuum Mobilolis.

**The Lane-Lynch Motor Company**, St. Louis, Mo., has changed its name to the Stutz Motor Sales Company. R. W. Immasche is in charge as manager.

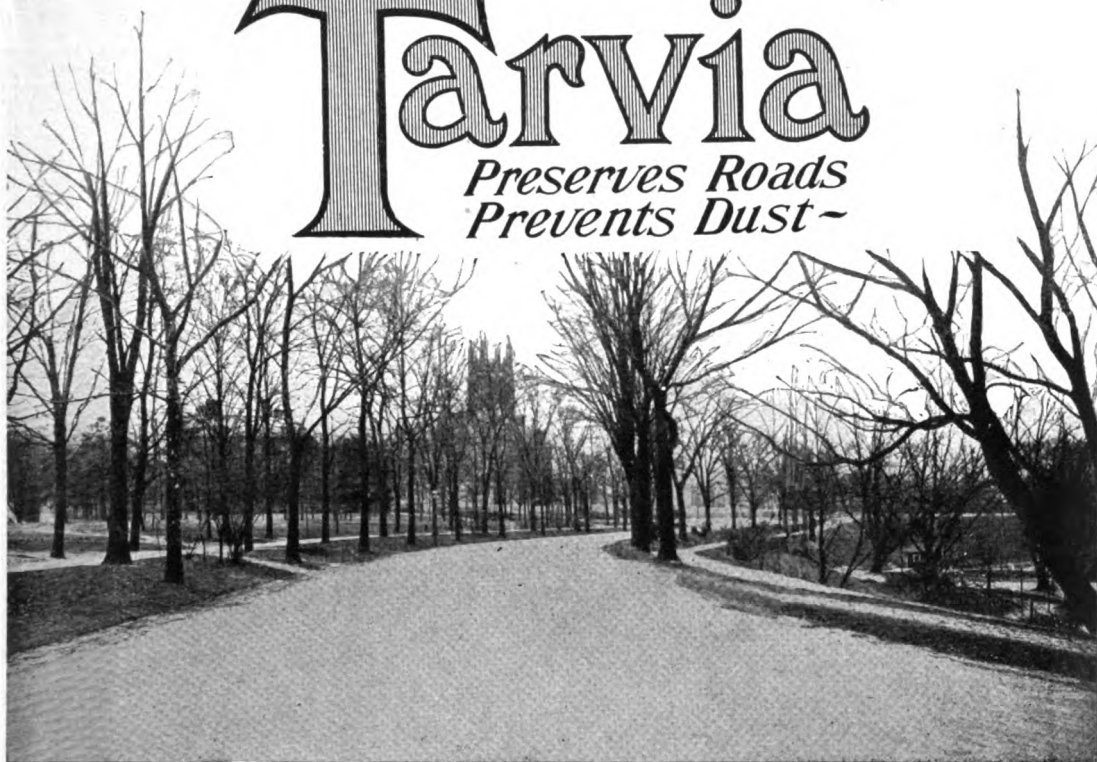
**The Miller Tire Sales Company**, New York City, has secured a location at 256 West 55th street, where it will handle the eastern distribution of Miller tires.

**The John V. Wilson Company**, manufacturers' selling representative of automobile and motorcycle equipment, has offices in Philadelphia and Boston, that in the latter city being located at 220 Motor Mart. The concern handles a wide line of well known goods, among which may be mentioned: Rhineland Machine Works Company's Rhineland ball bearings, A. V. shock absorbers, Lindhe laminated shim brass; Auto Parts Company's Apco Ford specialties; Dean Electric Company's Tuto, Rexo and Maxo electric horns, Dynalux lighting dynamos; N. Y. & N. J. Lubricant Company's Non-Fluid and Motorol oils; Fulton Company's Aermore exhaust horn, Rogers sidecar, Sabo



# Tarvia

*Preserves Roads  
Prevents Dust-*



Wade Park, Cleveland, Ohio. Treated with "Tarvia A."

## Cleveland's Experience with Tarvia

CLEVELAND'S experience with Tarvia has been very satisfactory. Tarvia has been used on the various roads in the parks and in the boulevard system. The following is taken from the Annual Report of the Department of Public Service:

"On the West Side, Edgewater Park and the Boulevard, the roads were treated two years ago with a surface coating of Tarvia and hence only needed a renewal coating of the same material with silica sand. This renewal cost was quite small and the results satisfactory. We would recommend a similar periodical recoating for the East Side roads about every other year.

"The results we have secured from the methods of resurfacing and repairing, as above set forth, are such that we hope the general plan may be continued on the

park roads not already repaired. This form of construction offers a hard, resisting surface to traffic and thoroughly preserves the road, whereas, in our opinion, the normal disintegration of the macadam roads has heretofore been hastened by oiling. The oil seems to be lacking in binding quality and tends to break up the macadam surface."

"Tarvia X" is a dense, viscid coal tar product of great cohesive and bonding power for pavement and road construction. "Tarvia A" and "Tarvia B" are lighter materials of the same nature for dust suppression and road preservation. "Tarvia X" and "Tarvia A" require heat for application. "Tarvia B" is applied cold. As a rule a tarviated road lasts so much longer than ordinary macadam that the cost of the Tarvia treatment is more than saved.

*Booklets on request*

### BARRETT MANUFACTURING COMPANY

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motorcycle locks, convertible tools; Jeffery-Dewitt Company's Rellance, J-D and Standard spark plugs; Fulton-McCutchan Company's K-C inner tires and sundries, Victor lamps and metal boxes, Lyndon speedlers and Ford specialties.

#### WITH THE MANUFACTURERS.

**P. J. Feely**, until recently automobile editor of the Portland Oregonian, has become assistant to Homer McKee, director of sales and advertising for the Cole Motor Car Company, Indianapolis, Ind., in charge of the Cole Bulletin.

**Edward T. Klee**, formerly with the Gibson Automobile Company, Indianapolis, Ind., has become service expert for the Stutz Motor Car Company of that city.

**J. C. MacFadyen** has been selected by the Goodyear Tire & Rubber Company to superintend the erection of its \$1,300,000 plant in Rio de Janeiro, Brazil.

**Robert Perkins**, Minneapolis, Minn., formerly with the Gemmer Manufacturing Company, has purchased the Massnick Phillips Manufacturing Company in that city, and will produce motors for cyclecars.

**C. T. Schaefer**, formerly connected with the Palmer-Meyer Motor Car Company, St. Louis, Mo., has been engaged to design a new two-ton truck for the Mogul Motor Truck Company of that city.

**J. M. Van Harlinger**, traffic engineering expert for the

Chicago, Ill., calls attention to the fact that the name of its Velvet auxiliary springs has been changed to Velvet shock absorber. The general officers of the company are located at 2110 Michigan avenue, Chicago, while the New York branch, which looks after the trade in the East, is at 74th street and Broadway.

**The Abbott Ball Company**, Elmwood, Hartford, Conn., has awarded the contracts for a one-story addition to its plant.

**G. L. Berg**, Seattle, Wash., has invented a new headlight, termed the Pathfinder, and a company has been organized with capital stock of \$35,000. William Piggott and G. D. Colwin are associated with him in the enterprise.

**Charles H. Besley & Co.**, Beloit, Wis., has broken ground for new buildings which will triple the size of its shops. The concern produces grinding and polishing machines.

**The Board of Trade**, Waterloo, Ia., is negotiating with the Denver Motor Truck Company, Denver, Col., to locate its gasoline-electric truck plant in that city.

**The John W. Brown Manufacturing Company**, Columbus, O., has started work on additions to its plant for the manufacture of lamps for Ford cars.

**The Baker Motor Vehicle Company**, Cleveland, O., had an interesting and instructive exhibit in the recent Perry centennial celebration in that city. Over 1000 automobiles were in line and at the head of the division was a delegation of Baker electric models, one for each year



**Baker Electric Models in Perry Centennial Parade, Cleveland, O., Headed by First Machine Made, Driven by Oldest Employee of Company Costumed as Father Time.**

International Motor Company, New York City, has resigned to go into business for himself as an expert truck and transportation adviser.

**The American Semi-Turbine Motor Company**, St. Louis, Mo., has been organized to produce a new internal combustion, coal oil burning engine for motor vehicles.

**The Firestone Tire & Rubber Company**, Akron, O., reports that the gross earnings of the company during the last fiscal year were approximately \$15,000,000, as compared with \$11,500,000 during the same period in 1912. The net profits were \$1,600,000, and the surplus, \$1,250,000. According to the balance sheet the current assets of the company were \$7,000,000.

**The Ford Motor Company**, Detroit, has opened a South American selling and service branch in Buenos Aires. E. H. Hampton will be in charge as manager.

**The Hampton Kerosene Carburetor Company**, New York City, has secured property for a factory site at the foot of Gordon street, Perth Amboy, N. J.

**The Lozier Motor Company**, Detroit, reports that the directors have subscribed for \$500,000 of the company's stock in order to finance the increased operations planned for 1914.

**The Mercer Automobile Company**, Trenton, N. J., maker of Mercer cars, is issuing a house organ under the title of Mercer Magic. W. A. Smith, advertising manager, is director of the new publication.

**The John W. Blackledge Manufacturing Company**,

of the company's existence. The oldest machine made, in 1899, was in the lead, and this was driven by the oldest employee of the company, costumed as Father Time.

**The Bundy-Goebel Manufacturing Company**, has been formed in Detroit for the production of the Tell Tale, a gasoline gauge.

**The Chicago Pneumatic Tool Company**, Chicago, has declared a quarterly dividend of one per cent., payable Oct. 25.

**The Cincinnati Car Company**, Cincinnati, O., is to erect an assembling depot near its main plant on Spring Grove avenue at a cost of \$30,000.

**The Columbus Auto Parts & Machine Company**, Columbus, O., is to place a collapsible top on the market, through the J. P. Gordon Company, North Fourth street, as distributor.

**The Pacific Motor Manufacturing Company**, 2610 South Main street, Los Angeles, Cal., has begun the production of a four-cylinder, air-cooled, T head motor for cyclecars. It has a contract for 300 automobile engines for the Perfection Motor Car Company.

**The Page Fence Company** is said to be interested in locating a windshield factory in Adrian, Mich., in charge of E. K. Conover of New York City.

**The Patterson Rubber Company**, which recently began the manufacture of tires, etc., at Lowell, Mass., announces that it will soon erect a new factory providing for an output of \$2,000,000 yearly.





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Unexcelled American Skill  
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When Writing to Advertisers, Please Mention The Automobile Journal.



## RECENT PATENTS.

- Motor Plow**, Leslie S. Hackmey, St. Paul, Minn. No. 1,074,115. Filed Sept. 19, 1910.
- Gaseous Fuel Mixer**, Willis S. Parker, Philadelphia, Penn., assignor to Delomont E. Notley and Willis S. Parker, copartners, trading as the Parker Manufacturing Company of the same city. No. 1,074,136. Filed June 11, 1913.
- Vehicle Spring**, Lewis A. Huston, New York City. No. 1,074,178. Filed July 28, 1913.
- Valve Seat**, John Henry Mixer, Shale, Cal. No. 1,074,191. Filed June 20, 1912.
- Hood of Motor Cars**, Anton Aumuller, Munich, Germany. No. 1,074,232. Filed May 6, 1912.
- Spring Wheel**, Roddie C. Behrends, Easton, Ill. No. 1,074,235. Filed Jan. 2, 1912.
- Lock for Automobiles**, Albert Austin Bennett, Los Angeles, Cal. No. 1,074,238. Filed June 10, 1913.
- Igniter**, Edwin Charles Jones, Toronto, Ontario, Canada, assignor of one-half to James Pearson of the same city. No. 1,074,265. Filed March 25, 1913.
- Spring Wheel**, Samuel James Poyner, Pierson, Manitoba, Canada. No. 1,074,290. Filed Sept. 3, 1912.
- Device for Stopping Engines**, Tom Elmer Johnson, Northwood, Ia. No. 1,074,327. Filed Sept. 21, 1912.
- Gearing for Motor Vehicles**, Eugene Harold Avery, Bradgate, Ia. No. 1,074,341. Filed Oct. 19, 1911.
- Automobile Horn**, Ray H. Manson, Elyria, O., assignor to the Dean Electric Company of the same place. No. 1,074,371. Filed May 6, 1912.
- Lap Robe**, George Sullivan, New York City. No. 1,074,389. Filed May 19, 1911.
- Magneto Ignition System**, John M. Dinkins and Franklin B. Hayes, assignors of eight-fifteenths to William Taylor, all of Indianapolis, Ind. No. 1,074,416. Filed June 5, 1908.
- Seat for Motorcycles**, Frank G. Kimpel, Edgerton, O. No. 1,074,438. Filed May 20, 1913.
- Lamp**, Donald D. Myers, Lafayette, Ind., assignor to the Esterline Company, Indianapolis, Ind. No. 1,074,449. Filed April 21, 1913.
- Self-Closing Funnel**, Karl Heinrich Rosenauer, Frankfurt-on-the-Main, Germany. No. 1,074,465. Filed March 18, 1911.
- Clutch Construction**, Powell Evans, Philadelphia, Penn. No. 1,074,500. Filed May 8, 1912.
- Headlight Control**, Harvey W. Potts, Longmont, Col. No. 1,074,527. Filed March 28, 1913.
- Magneto**, Carl Ebner, Stuttgart, Germany. No. 1,074,542. Filed March 9, 1910.
- Carburetor**, Edgar A. Rlotte, Bronxville, N. Y., assignor to the Standard Motor Construction Company, Jersey City, N. J. No. 1,074,575. Filed Jan. 16, 1912.
- Starting Valve Gear**, Jean Romeyn, Brussels, Belgium. No. 1,073,633. Filed June 17, 1912.
- Internal Combustion Engine**, Paul S. Smith, Newburg, N. Y. No. 1,073,640. Filed April 22, 1909.
- Internal Combustion Engine**, William James Wright, Franklin, Penn., assignor to the Wright Engine Company, Pittsburgh, Penn. No. 1,073,652. Filed March 5, 1912.
- Combustion Engine**, Guido Fornaco, Turin, Italy. No. 1,073,671. Filed Aug. 12, 1911.
- Gasoline Tank**, Leland F. Goodspeed, Milwaukee, Wis., assignor to the Milwaukee Locomotive Manufacturing Company of the same city. No. 1,073,676. Filed Feb. 17, 1912.
- Primary Battery Cell**, Julius H. Gugler and George W. Colles, Milwaukee, Wis., said Colles assignor to said Gugler. No. 1,074,677. Filed June 22, 1910.
- Valve Guiding Tool**, Herman, Bernard and Peter Horn, Washita County, Okla. No. 1,073,686. Filed Dec. 21, 1911.
- Vehicle Wheel**, John F. Mitchell, Topeka, Kan. No. 1,073,697. Filed Sept. 26, 1907.
- Carburetor**, Leonard Atwood, Boston. No. 1,074,727. Filed April 14, 1909.
- Acetylene Gas Generator**, Charles H. Long, Fairbury, Neb. No. 1,073,767. Filed Jan. 15, 1913.
- Internal Combustion Engine**, Luther O. Martin, Parkersburg, W. Va. No. 1,073,770. Filed Jan. 25, 1912.
- Variable Speed Transmission Gearing**, Joseph Michael, Fort Kent, Me. No. 1,073,775. Filed June 14, 1912.
- Front Vehicle Suspension**, Ramon Febres Cordero, Rubio, Venezuela. No. 1,073,796. Filed July 25, 1911.
- Vehicle Spring Equalizer**, George M. Huston, New York City. No. 1,073,804. Filed May 31, 1913.

- Electrically Heated Garment**, Anton Pollak, Paris, France. No. 1,073,926. Filed March 12, 1912.
- Automobile Attachment**, William J. Evans, Linnburg, Ia. No. 1,073,971. Filed Sept. 20, 1912.
- Lever Lock**, Oliver A. Benham, Dayton, O. No. 1,074,038. Filed Dec. 23, 1912.

## COMING EVENTS.

## October.

- Oct. 11—Track races, Springfield, Ill.
- Oct. 12-17—Convention, American Institute of Metals, Chicago, Ill.
- Oct. 12-17—Convention, Carriage Builders' National Association, St. Louis, Mo.
- Oct. 13-18—National fire prevention conference, Philadelphia, Penn.
- Oct. 15-25—Electrical Show, Grand Central Palace, New York.
- Oct. 17-27—Automobile Salon, Grand Palais, France.
- Oct. 18-19—Track races, St. Louis, Mo.
- Oct. 24—Convention, American Iron & Steel Institute, Chicago, Ill.
- Oct. 27-28—Convention, Electric Vehicle Association of America, Chicago, Ill.

## November.

- Nov. 2-3—Road race, El Paso, Tex.-Phoenix, Ariz.
- Nov. 3-8—Motorcycle show, Coliseum, Chicago, Ill.
- Nov. 4-5—Road race, Los Angeles, Cal.-Phoenix, Ariz.
- Nov. 4-5—Road race, San Diego, Cal.-Phoenix, Ariz.
- Nov. 6—Track races, Phoenix, Ariz.
- Nov. 8-12—Track races, Shreveport, La.
- Nov. 7-15—Olympia Show, London, England.
- Nov. 8-15—Show, Atlanta, Ga.
- Nov. 22-29—Show, Providence, R. I.

## December.

- Dec. 1-3—Annual meeting, American Automobile Association, Richmond, Va.
- Dec. 9-12—Convention, American Road Builders' Association, Philadelphia, Penn.
- Dec. 10-12—Convention, Retail Implement & Vehicle Dealers' Association, Milwaukee, Wis.
- Dec. 11-20—International exposition of safety and sanitation, American Museum of Safety, New York City.

## January.

- Jan. 2-10—Importers' Salon, Hotel Astor, New York City.
- Jan. 3-10—Pleasure car show, Grand Central Palace, New York City.
- Jan. 24-31—Show, Rochester, N. Y.
- Jan. 24-31—Pleasure car show, Coliseum, Chicago, Ill.
- Jan. 26-31—Show, Scranton, Penn.
- Jan. 31-Feb. 7—Show, Minneapolis, Minn.

## February.

- Feb. 2-7—Pleasure car show, Buffalo, N. Y.
- Feb. 9-14—Truck show, Buffalo, N. Y.
- Feb. 22-27—Show, Omaha, Neb.
- Feb. 22-March 5—Show, Cincinnati, O.
- Feb. 24-28—Show, First Regiment Armory, Newark, N. J.

## March.

- March 7-14—Pleasure car show, Mechanics' Building, Boston, Mass.
- March 17-21—Truck show, Mechanics' Building, Boston, Mass.

## NEW BOOKS RECEIVED.

**F & S Annular Ball Bearings**, issued by the J. S. Bretz Company, 250 West 54th street, New York City. Illustrated price list of this equipment. Contains a number of useful mechanical tables. Sent free upon request.

**The A. V. Shock Absorber**, issued by Hudson Export & Import Company, 140 West 42nd street, New York City, sole agent for this equipment in America. Illustrates and describes in detail the construction and application of this device. Sent free upon request.

**Cole Blue Book**, published by the Cole Motor Car Company, Indianapolis, Ind., and edited by Homer McKee. It is a handbook and catalogue of the 1914 Cole models, combining a detailed description of the various components and an interesting story of how the standardized car came into being. The work is fully illustrated and forms a valuable encyclopedia of information concerning the product of the company. Sent free upon request.



## RECENTLY ANNOUNCED 1914 MODELS.

**F**OUR entirely new cars are to be found among the list of new models announced below. The brief statements presented include only the more important features or changes in design as made public by the manufacturers:

**Regal**—Regal Motor Car Company, Detroit. Models T, N and NC, underslung, and C, overhung. Underslung bodies, touring car, roadster and coupe on same chassis. Overhung body, touring car. Principal changes include left hand drive, centre control, electric lighting and starting and elimination of side lights. Other changes mainly in refinement of details. Cars listed with full equipment this year.

**Detroit Electric**—Anderson Electric Car Company, Detroit. Models 43, four-passenger brougham with rear seat drive; 44, ladies' open victoria; 45, five-passenger brougham with front seat drive; 46, gentlemen's roadster; 47, four-passenger brougham, and 48, Duplex drive brougham. First three fitted with bevel gear rear axle. Last three have new Daimler-Lanchester imported worm gear. All are equipped with Hanlon patented rain vision window. Full aluminum bodies and fenders, and Detroit Electric shaft drive, chainless power plant continued. Price reductions on all models.

**Crow Elk-Hart**—Crow Motor Car Company, Elkhart, Ind. Three chassis and 10 body designs. Models D42 and D45, roadster and touring, have 35 horsepower motor four-cylinder, L head, cast in pairs. Models D52, D54, D55 and D56, roadster and touring cars, have 40 horsepower motor, four-cylinder, L head, 4.125-inch bore, 5.5-inch stroke, cast en bloc. Models D62, D64 and D66, roadster and touring cars, have 50 horsepower motor, six-cylinder, L head, 3.875-inch bore, five-inch stroke, cast in pairs. Briggs magneto on the small four, Briggs Mag-Lite ignition on the large four, and Deaco ignition, starting and lighting on the six.

**S. & M.**—S. & M. Motor Company, Detroit. New concern. One chassis and four body designs—runabout, five and seven-passenger touring and limousine. Motor, Continental special, six-cylinder, 3.75-inch bore, 5.25-inch stroke, rated at 58 horsepower at 2000 revolutions. Bosch magneto, Timken front and rear axles, wire wheels with Timken hubs, Warner four-speed transmission, Gemmer steering gear, Rayfield carburetor, Mayo radiator, Parish & Bingham frame, Spicer universal joints, Firestone tires, electric starter. Springs, semi-elliptic front, three-quarter elliptic underslung rear. Left hand drive, centre control. Wheelbase, 130 inches. Weight, 3250 pounds. Full equipment.

**Oldsmobile**—Olds Motor Works, Lansing, Mich. Model 54. Five and seven-passenger touring car bodies. Larger motor; 4.25-inch bore and 5.5-inch stroke, instead of 4.125 by 4.75; increased rating from 40.8 to 50 horsepower. Six cylinders, still of L head type, but cast in sets of three. Valve size increased from 1.75 inches to 1.9375. Latest type Delco starting, lighting and ignition system. Cooling by centrifugal pump, instead of gear. Later type of Oldsmobile float feed carburetor. Wheelbase of five-passenger now 132 instead of 135, and of the larger car 139. Tires, 36 by five inches, on Baker straight side demountable rims. External appearance is not greatly changed, except that bodies are hung lower than formerly. Price reduced \$225.

**Monarch**—Monarch Motor Car Company, Detroit. New concern. R. C. Hupp, president. Five-passenger touring car. Motor, four-cylinder, four-cycle, cast in pairs; 3.1875-inch bore, five-inch stroke, rated at 25 horsepower; water-cooled, thermo-syphon; force feed lubrication; float feed carburetor; combined electric starting, lighting and ignition system. Leather faced cone clutch. Selective sliding gear transmission, three speeds forward and reverse. Three point suspension, motor and transmission on tubes. Drive by shaft, not enclosed; double universal joint. Semi-floating rear axle. Semi-elliptic springs forward, full elliptic rear. Pressed steel frame. Wheelbase, 110 inches. Tires, 32 by 3.5 inches. Tor-

pedo type body, stream line, with radiator under sloping hood. Left hand drive, centre control. Equipment includes rain vision windshield, extension top, Jiffy curtains, Jones speedometer, electric horn, etc.

**Flyer**—Thomas Howard Company, sole factory representative, 319 Atlantic avenue, Brooklyn, N. Y. New car. Roadster. Motor, four-cylinder, four-cycle, water-cooled, cast en bloc, 2.75-inch bore, 4.5-inch stroke; barrel type crankcase, three-bearing crankshaft; vacuum feed oiling system, circulating water pump, magneto ignition. Cone clutch, 11 inches diameter, three-inch face, enclosed with flywheel. Transmission, two speeds forward and reverse. Unit power plant. Left hand drive, centre control. Springs, semi-elliptic front, full elliptic rear. Wheelbase, 100 inches. Tires, 28 by three inches, clincher rims. Wire wheels. Equipment includes windshield, two gas headlights, generator, two side oil lamps, rear lamp, tool kit, etc.

**Marmon**—Nordyke & Marmon Company, Indianapolis, Ind. Models 32, four-cylinder, and 48, six-cylinder, continued. New body designs, including three-passenger on six-cylinder chassis. New design of Northeast starting and lighting system, necessitates changes in location. Magneto at the rear of motor instead of front. Zenith carburetor. Addition of single-cylinder motor driven air pump for tire inflation. Clutch on the four is given a wider face and slightly different spring inserts. Brake surface on the six has been enlarged in diameter and the brake adjustment is fitted with a double worm screw design. New type of front hub and steering knuckle on the six, shaped like a bullet and so arranged that the vertical spindle is directly in the centre line of the wheel.

**Howard**—Howard Motor Car Company, Connersville, Ind. New six-cylinder model. Continental motor, specially designed to specifications of Chief Engineer J. C. Moore of Howard company. Exhaust system has two manifolds, two flexible exhaust pipes and two separate mufflers, the idea being that by having successive cylinders in their order of firing exhausting into alternate mufflers the possibility of exhaust gas diluting the incoming charge is effectually obviated. Bore, 4.125 inches; stroke, 5.25. Ignition, Bosch high-tension magneto and Atwater-Kent system. Cone clutch. Three-speed transmission. Timken axles. Springs, semi-elliptic forward, three-quarter elliptic rear. Tires, 36 by 4.5 inches. Left hand drive, centre control. Electric lighting and starting.

**Imperial**—Imperial Automobile Company, Jackson, Mich. Models 32, 33 and 34, all four-cylinders. Model 44 now a six instead of four. An entirely new six with seven-passenger body. Models 32 and 33 on same chassis with new motor, 4.25-inch bore and 5.25-inch stroke, instead of four by 5.5. Cylinders cast en bloc. Model 34 unchanged except for refinements. Model 44 motor has cylinders cast in sets of three, 3.75-inch bore, 5.25-inch stroke. New chassis has motor cast in threes, 4.125-inch bore, 5.25-inch stroke; unit power plant; three point suspension. Multiple disc clutch, Raybestos faced. Three speeds forward and reverse. Full floating rear axle. Springs, semi-elliptic forward, three-quarter elliptic rear. Wheelbase, 137 inches. Tires, 36 by 4.5 inches. Body hung low. Left hand drive, centre control. All models now electrically lighted and started.

Among the interesting exhibits of fire apparatus at the recent convention of fire chiefs at New York City were three pieces of apparatus manufactured by the American-La France Fire Engine Company, Elmira, N. Y. These cars were equipped with the Goodrich wireless tire, made by the B. F. Goodrich Company, Akron, O. The tires are built on a steel base which is inseparably attached to the steel rim of the wheel, wires being eliminated.



## ANNUAL ROAD CONGRESS IN DETROIT.

**A**BOUT 4000 delegates, representing motoring and good roads organizations, attended the third annual road congress, under the auspices of the American Highway Association in Detroit, during the week of Sept. 29-Oct. 4. The sessions were devoted largely to the consideration of improved highway methods and the results which have been obtained in various sections.

David F. Houston, secretary of agriculture, delivered an address in which he stated that the suggestion of great national transcontinental roads appealed to his imagination. He complimented the motorists for the service they have rendered in their propaganda for road building, but held that the construction of such highways was quite as essential for the transportation of farm products to market and to the establishment and operation of decent elementary and secondary schools for the benefit of country boys and girls. He said in part:

There are complex problems to be solved in many states before the most efficient expenditure of money by states and communities for roads can be secured, and there are many more to be worked out before one can rationally expect the federal government largely to participate. Who shall say how aid should be apportioned so that the states may receive equitable treatment? Shall it be apportioned equally among the states on the basis of total population, farm population, area, taxable valuation, road mileage, or all these; and should federal money be expended exclusively through its own agencies for a certain system?

That the suggestion of federal aid to road building raises grave questions and involves possible dangers, no thoughtful citizen doubts. There are proposals before the public mind which would bankrupt the federal treasury and suggest possible abuses before which those of the worst pork-barrel bills of the past would pale into insignificance. No proposal which does not carry with it the assurance of safeguarding the treasury in this direction seems to me to stand the ghost of a chance of favorable consideration.

Secretary Houston suggested as the first practical essential in the planning of road legislation, the recognition of the state as the smallest unit with which the federal government might deal, the initiative to rest with the highway department of the state, the federal agency to reserve the approval of the selection, supervision of the construction and the right of inspection. He also would have some automatic check upon the demands to be made upon Congress, this to be founded upon a number of basic factors, including population, area, wealth, minimum cost of construction, etc.

Col. William D. Sohier, chairman of the Massachusetts state highway commission, gave an extended report of the international road congress recently held in London, and reviewed some of his observances while abroad. He explained

that if his commonwealth were to secure any such road system as that recommended by the international congress, it would require years of work and millions of dollars in money. He estimated it would mean the expenditure of \$5,000,000 and the next 20 years to complete the main trunk and secondary highways alone.

Congressman D. W. Shackleford, chairman of the House committee of roads, stated that he was "not in harmony with the dominant spirit" of the convention. He urged support for the "business roads" class, which, he said, aimed for cheaper transportation and lower cost of living, rather than the "touring roads" class, which, he held, demanded that the federal government devote its energies to the construction and maintenance of a few ocean-to-ocean and cross country highways and then leave the rest of the people to look out for themselves. He said in part:

You gentlemen are seeking to promote the construction and maintenance of a limited mileage of excellent highways, while I am seeking to secure the construction and maintenance of a general system of good roads. You want 50,000 miles of expensive touring roads to be built in 40 years. I want a million miles of business roads and post roads to be built in five years. I appeal to you to withdraw your opposition to a plain people's plan, which we desire to pass through Congress at the next session. Our plan will not be expensive and a vast majority of the people favor it.

In the last Congress we passed through the House a bill providing a yearly contribution to each mile of roads in the states which should be constructed and maintained according to specified standards. The bill failed in the Senate. I am informed that the American Automobile Association claims the credit for its defeat. But, had that bill become a law, it is my candid opinion that within one year it would have given us 50,000 miles of improved roads and in five years would have given us a million.

Practically every plan for securing improved highways was given consideration by the conference. It was noticeable that the propositions, including the use of federal money in road construction, were given much greater attention than ever before in a convention of this character.

## STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC.

Of The Automobile Journal Published Semi-Monthly at Pawtucket, Rhode Island, required by the act of August 24, 1912.

NOTE—This statement is to be made in duplicate, both copies to be delivered by the publisher to the postmaster, who will send one copy to the Third Assistant Postmaster General (Division of Classification), Washington, D. C., and retain the other in the files of the postoffice.

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Sworn to and filed with Postmaster July 11, 1913.  
WILLIAM H. BLACK, Editor.  
ARTHUR H. CAPWELL,  
Notary Public.



## LONG DISTANCE ELECTRIC TOUR.

### Bailey Car with Edison Battery Covers 258 Miles Without Difficulty.

In connection with the convention of the New England Section, National Electric Light Association, in Burlington, Vt., last month, E. W. W. Bailey, general manager of S. R. Bailey & Co., Amesbury, Mass., drove a Bailey electric, fitted with Edison battery, made by the Edison Storage Battery Company, Orange, N. J., from Boston to Burlington, a distance of 258 miles. The trip was undertaken to try the performance and availability of this type of car and the Edison battery through supposedly difficult country and over a route never before attempted by an electric, and, being successful, to demonstrate to the convention and the residents of the district traversed that the era of the electric roadster has arrived.

The itinerary led from Boston to Fitchburg; through Ashby, Jaffrey, Dublin and Marlborough to Keene, N. H.; thence, in the evening, through Walpole and Bellows Falls into Springfield, Vt. The next morning the trip was resumed through Rutland, Brandon, Middlebury, New Haven and Vergennes to Burlington. The average speed for the whole distance was exactly 19 miles an hour. The slowest run, from Keene to Springfield, 42 miles, was covered at 16.7 miles an hour, and this was made almost entirely after dark. The hardest part of the route was from Springfield to Rutland, this being fairly mountainous, with repeated descents to valleys and through several places where road repairs were under way and could not be avoided.

The car was a model E Bailey roadster, equipped with 60 cells, Edison battery of the new A-5 size. It was not a special car, but was taken from service after having been 10,700 miles during the last 11 months. No adjustments or repairs of any kind were required or made on the way. No attempt was made to run the machine an extreme distance on one charge, such not being good touring practise and not necessary. The car was given a full, normal charge before leaving Boston, and no other full charge was given the battery en route. Partial charges were taken at Fitchburg, Keene, Springfield, Rutland and Middlebury, at rates varying from 30 to 150 amperes. The normal charging rate of the battery is 37.5 amperes.

The Knox Automobile Company, Springfield, Mass., reports that the business for August increased 100 per cent. over the same month in 1912.



## Get the New Stutz Series "E" Catalog—Now Ready

### See the Sturdy Stutz Before You Decide

All we ask is, that before you select your next motor car, you compare the Stutz, part by part, with any car at any price—then you, too, will decide in favor of the Sturdy Stutz.

### New Models Even Better Than Previous Stutz Cars

In the new Series "E" Stutz, no radical mechanical changes have been made—they were not necessary. Just a few details have been altered, insuring even greater service and power, with a few touches that add to the graceful beauty lines for which all Stutz models have been famous.

The bodies of the Touring Cars are larger, roomier and even more comfortable than ever before. The upholstery is more generous, the springs are a little longer—the same perfection mechanically has been maintained.

The Electric Starting, Lighting and Ignition systems are **separate units**; simple, dependable and easy to operate. So, before you decide, write for our new illustrated catalog No. A-5, Series "E." We will put you in touch with your nearest Stutz dealer.

**We still have some desirable territory open and will make a satisfactory contract with responsible dealers—write us.**

### Stutz Motor Car Co., of Indianapolis



Four-Cylinder Roadster \$2000  
Six-Cylinder Roadster \$2250

STUTZ — the car that made good in a day



**Dover Soap Economizer** **Dover Electric Light Bulb Case** **DOVER SAVAL MEASURE AND FUNNEL**



Saves over one-third soap consumption      Safe and Very Compact      Send for 1913 Catalogue

With Automatic Shut-Off Prevents Overflowing Oil Tank

**DOVER STAMPING & MFG. CO., Cambridge, Mass.**

**QUALITY HARRIS BEST FOR LUBRICANTS TRADE MARK REG. U.S. PAT. OFF. YOUR CAR OILS**

**A. W. HARRIS OIL COMPANY**  
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BOOKLET ON REQUEST      REPRESENTATIVES WANTED

**AUTOMOBILE TURNTABLES**

**THE T. C. BEACH CO.**      106 Ottawa Street,      St. John, Mich.

Your tire troubles are over if your car is equipped with  
**Dayton Airless Tires**

Send for "Catechism"; shows you how motoring expense can be cut down and motoring pleasure increased.

**Dayton Rubber Mfg. Co.,**      1011 Kiser St., Dayton, Ohio

For Perfect Control and Safe, Comfortable Driving use  
**Weed Anti-Skid Chains**

At all Reputable Dealers  
**Weed Chain Tire Grip Co., New York**

**CATARACT TIRE SERVICE**  
**THE 10% OVERWEIGHT TIRES**  
Guaranteed for 4000 Miles Service

Measured by Mileage, the Cheapest Shoes Ever Made.  
Clincher and Quick Detachable, Plain and Break-Skid, Treads, Regular and Metric Sizes, for All Standard Rims.

**THE CATARACT RUBBER COMPANY**  
Boston, New York, Providence.      Factory: WOOSTER, O.

**GEISZLER NON-SULPHATING STORAGE BATTERIES**

Guaranteed perfect satisfaction or money refunded

**SIZE 66 - \$20.00**

**GEISZLER BROS. STORAGE BATTERY COMPANY**  
514 West 57th Street, New York City



Bay State Autokit, No. 1, \$10  
Bay State Autokit, No. 2, \$7.50  
Bay State Stickit, \$3

**GEO. A. CUTTER, Sales Agent**  
Taunton, Mass.

DON'T let rim rust destroy your tires;  
Paint them twice a season with  
**THOMAS' ANTI RIM RUST PAINT**

One dollar a can at your dealers, or write us  
**The Anti-Rust Paint Co., Dept. 7, Akron, Ohio**

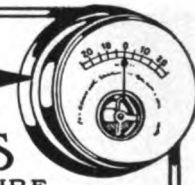
**STANWELD RIMS**

Mechanically correct—easy to operate—perfect in material and workmanship. Used as standard equipment on the better cars.

**THE STANDARD WELDING COMPANY**      Cleveland, Ohio

ALWAYS SPECIFY  
**HOYT METERS**

AND GET YOUR MONEY'S WORTH  
**HOYT ELECTRICAL WORKS**  
INSTRUMENT  
PENACOOK, NEW HAMPSHIRE



**THE "SIX-48" KEETON**  
REPRESENTS  
The "finer points" of EUROPEAN DESIGN  
\$3250 Completely Equipped  
Interesting literature sent on request  
**KEETON MOTOR COMPANY**  
467 Lawton Ave.,      Detroit, Mich.

**THE MOTOR TRUCK**

A National Motoring Magazine Devoted  
Exclusively to the Commercial Field

**12 ISSUES \$1.00 THE YEAR**

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# The "Black Eagle" Spark Plug

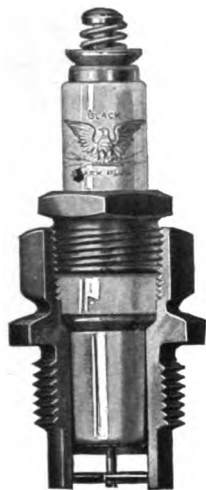
PATENTED

## 50 Cents Is Enough

The "Black Eagle" Spark Plug has made good because it was designed and manufactured with this result in view.

A person in close touch with the supply and manufacturing ends of the trade was a visitor at our factory recently, and was shown the details of construction, including the machinery, testing, and assembling of the "BLACK EAGLE" Spark Plug. What he said we believe will be of interest to you, as it indicates the effort on our part to supply a high grade plug at a reasonable price. We therefore quote below his impressions.

"I am simply amazed at the workmanship, material, and construction of the 'BLACK EAGLE' Spark Plug. When I saw this plug advertised at a price of 50c to the consumer, I naturally supposed it was a cheap, common, plug such as you occasionally find in jobbing houses on the bargain counter. I am convinced, after seeing these plugs tested, and examining minutely the machine parts which enter into their construction, that no better porcelain spark plug is offered by any one, regardless of the price they ask."



We are not influenced by what our competitors charge for spark plugs! We have ignored price precedent, for the reason that a high grade spark plug can be manufactured and sold at 50c each, and that is enough.

Sent prepaid on receipt of price. Made in all standard threads.

### THE STANDARD CO.

### Torrington, Conn., U. S. A.

## Let Your Motor Do The Work

The Pump that took the "Shun" out of Inflation.

It's a pleasure to inflate your tires without sweating, fuming and straining.

It's an economy to get the exact pressure you need to make your tires give maximum service.

It's a convenience to attach and detach your pump without a wrench. A twist of the wrist and a few seconds of time to attach the pump, one to four minutes with your motor at low speed to get the right pressure. The gauge tells you when to stop.

**THE BROWN IMPULSE TIRE PUMP for 1913** is the **only** tire pump that attaches and detaches without a wrench; the **only** one that includes hose, self-opening valve connection, high grade recording gauge and Quick Detachable Spark Plug as part of its regular equipment. Your 1913 equipment is not complete without it. It sells for \$15.00. Ask your dealer today. If he can't tell you all about it, send to us for descriptive literature.

THE BROWN COMPANY, 222 Bellevue, Syracuse, New York.



## DECARBONIZER

Chemically removes carbon from cylinders, pistons, rings and valves

**INCREASES POWER 20 PER CENT.**

Volatilizes carbon, in which form it passes out thru exhaust; injury to metal impossible. Agents wanted in certain localities. Sample quart can \$1.50. Write today for particulars.

MILWAUKEE AUTO SPECIALTY COMPANY  
126 Second St., Milwaukee, Wis.




The **RIGHT** way to light the way

Give up gas and oil lamps for the  
**APLCO ELECTRIC LIGHTING SYSTEM**

Can be installed on the car you drive at little expense. Write us.  
**THE APPLE ELECTRIC CO.**  
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King Winter  
cuts no ice, if your  
radiator contains  
**THERMITE**  
"The Great anti-freeze"

Diluted one half, it  
prevents freezing at  
twenty below zero.

Price \$1.25  
At any up-to-date supply house.

**THE NORTHWESTERN  
CHEMICAL CO.**  
Marietta, Ohio.

Makers of  
**SEMENT-OL**

**THERMITE**  
THE NEW ANTI-FREEZE



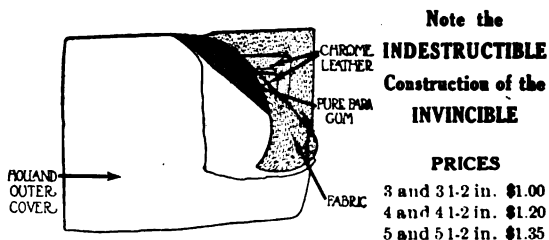
## Blow-Outs Prevented

By Using the

### Invincible Blow-Out Patch

#### THE ONE PRACTICAL PATCH MARKETING

No need of a Tire Sleeve with the INVINCIBLE, it's stronger than a new shoe. It "Stays Put." Soft and pliable and is easily fitted. To attach, remove protective cover, moisten gum with gasoline and insert in casing. The INVINCIBLE is self-vulcanizing. If your local dealer does not carry them, send us his name and your order.



A Good Proposition Is Offered to Live Dealers and Garages

Write For Particulars to the

### INVINCIBLE TIRE COMPANY

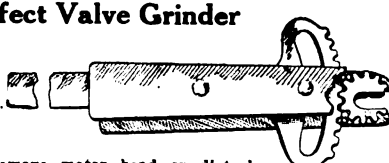
CHAS. H. GRAVES, Treas.

53 Sabin Street

PROVIDENCE, R. I.

### WILL GRIND FORD VALVES

#### Wall's Perfect Valve Grinder



Patent Pending.  
Patents Allowed.

No need to remove motor head or disturb valve mechanism. A simple, practical tool, that works automatically and any one can operate it. Guaranteed, and will last for years. A new, simple and practical guide for owner, driver and repairer. Keep your valves in perfect condition. Cost of grinder saved first time used. For circulars and price list write

**J. H. WALL, 290 Hope Street, BRISTOL, R. I.**

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### Automobile Cylinder Oils

INDIAN REFINING CO.

17 Battery Place New Jersey

## DIXON'S GRAPHITE CUP GREASE

the Ideal Lubricant for Wheel Bearings, Being Permanent and Economical. Write for the Book "Lubricating the Motor," No. 210.


**JOSEPH DIXON CRUCIBLE CO.**

Jersey City (4) New Jersey

### Get This Free Book

It tells the real facts about ALL lighting systems for the automobile and motorcycle. It will save you time, money, trouble. Write for the "Report of the Speedway Tests" today.

**The Prest-O-Lite Company, Inc.**  
226 Speedway, Indianapolis, Ind.



### FOR YOUR AUTO OR GARAGE

A few shots of Pyrene, even if directed through the radiator, will put out the most stubborn fire—so quickly that it will surprise you.

Write for Booklet

**PYRENE COMPANY OF NEW ENGLAND**  
176 Federal Street, Boston, Mass.

## KING MOTOR CARS


For Long Service at Low Upkeep

### \$1095 WITH EQUIPMENT

Ward Leonard Starter and Generator \$100 extra.

30-35 H. P. Two Styles—Touring Car and Roadster.

**KING MOTOR CAR CO., Detroit. Show Room, New York.**



Electric self-energizing, electrically lighted.  
Four Forward Speeds.

"Six Thirty-Six" Touring Car and Roadster - \$1850  
Model 30 Touring Car - \$1350  
Model 30 Roadster - \$1250

The Thoroughbred Car.

Live wire dealers, write for unallotted territory.

**HERRESHOFF MOTOR COMPANY, Detroit, Mich.**

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# Classified Buyers' Guide

A Handy Reference for Purchasers

## ACCESSORY MANUFACTURERS AND JOBBERS.

**Auto Parts Co.,** Providence, R. I.  
**Hopewell Brothers,** Newton, Mass.  
 Branch: 1974 Broadway at 67th St., New York.  
**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City.  
**Miller, Chas. E.,** 97-103 Reade St., New York.  
 Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 259 Peachtree St., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.  
**Milwaukee Auto Specialty Co.,** 128 Second St., Milwaukee, Wis.  
**Motor Parts Co.,** 185-187 Columbus ave., Boston; 818 No. Broad St., Philadelphia; Springfield, Mass.  
**Northwestern Chemical Co.,** Marietta, O.  
**Waite Auto Supply Co.,** 81 Exchange place, Providence.

## ACETYLENE TANKS. (See Tanks.)

## ADJUSTERS.

**Vansickle, John A.,** Indianapolis. (Ford Ideal Ball and Socket Joint.)

## AIR COMPRESSORS AND TANKS.

**Williams Foundry & Machine Co.,** Akron, O.

## AMMETERS AND VOLTMETERS.

**Hoyt Electrical Instrument Works,** Penacook, N. H.

## AUTOMOBILES. (See Cars.)

## AUTOMOBILE SPECIALTIES.

**Cox Brass Mfg. Co.,** Dudley Ave., Albany, N. Y. (Brass Goods.)  
**Motor Specialties Co.,** 2 Cooper Lane, Waltham, Mass.

## BALLS AND BALL BEARINGS.

**Boyd, F. Shirley,** 903 Boylston St., Boston. (R. I. V.)  
**Brets Co., J. S.,** 250 W. 54th St., New York. (F. & S.)  
**Hyatt Roller Bearing Co.,** Detroit.  
**Marburg Bros., Inc.,** 1790 Broadway, New York. (S. R. O.)  
**New Departure Mfg. Co.,** Bristol, Conn.  
**Rhineland Machine Works Co.,** 140 W. 42nd St., New York City.  
 Branches: 1254 Michigan Ave., Chicago; 650 Woodward Ave., Detroit; 1424 Vine St., Philadelphia; 220 Motor Mart, Boston.  
**R. I. V. Co.,** 1771 Broadway, New York. (R. I. V.)

## BATTERIES.

**Burn-Boston Battery Co.,** 19 Doane St., Boston.  
**Electric Storage Battery Co.,** Philadelphia. (Exide.)  
**Gelsner Bros. Storage Battery Co.,** 514 W. 57th St., New York.  
**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City. (J-M.)  
**Waite Auto Supply Co.,** 81 Exchange place, Providence. (Success.)  
**Willard Storage Battery Co.,** 5716 Euclid Ave., Cleveland. (LBA Lighting and Starting.)  
 Branches: 136 West 52nd St., New York; 1191 Woodward Ave., Detroit; 2241 Michigan Ave., Chicago; 243 Monadnock Bldg., San Francisco.

## BATTERY EXTINGUISHERS.

**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City.

(Continued on Next Page.)

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## EMCO Automobile Oil is thoroughly genuine

EMCO is the one Automobile Oil that is thoroughly genuine. It is so far superior in every respect that comparison is impossible.

Emco is strictly a mineral oil, refined right in the heart of the Pennsylvania Crude Oil fields. It is absolutely free from all carbon, acid, animal or vegetable ingredients, which makes it wonderfully consistent and remarkably economical. It lasts nearly twice as long as most oils.

Furthermore Emco Automobile Oil is sold under the following guarantee of satisfaction:

### GUARANTEE

If Emco Oil does not prove satisfactory to YOU in absolutely every respect, we will refund your money in FULL—pay freight (both ways if oil is returned) and make no charge for oil used in trial.

If your dealer cannot supply you, we will ship Emco direct to you in five or ten gallon cans, barrels or half barrels.

## EMERY MANUFACTURING COMPANY

LEWIS EMERY, JR., Proprietor  
 General Offices: 45 Main Street, Bradford, Pa.

Strictly independent refiners, manufacturing Teedorized Gasoline, and Lubricating Oils of every description.

New York Branch: 1010 U. S. Rubber Bldg., 58th and Broadway  
 References: Dun's, Bradstreet's or any National Bank.

## GYROSCOPE PRINCIPLE

The New Jones Speedometer Unaffected by Heat or Cold

Any motor car maker will equip with it if you state plainly you want nothing else, no matter what speedometer he may list in his catalog as equipment.

Write us for facts, test and experiments that show Jones supremacy beyond question.

THE JONES SPEEDOMETER—Broadway at 76th Street, NEW YORK

*Elyria-Dean*

Trade Mark

## ELECTRICAL APPARATUS OF QUALITY

Tuto (\$15.00) and Rexo (\$8.00) Auto Horns

THE DEAN ELECTRIC COMPANY

546 Olive St., ELYRIA, O.

EDWARDS  
FIREPROOF  
STEEL

## GARAGES

For Automobiles and Motorcycles

\$30 and Up

Easy to put up. Portable. All sizes. Postal brings latest illustrated catalog.

THE EDWARDS MFG. CO.,

414-464 Eggleston Ave.,  
Cincinnati, Ohio





**"THE TUGBOAT OF LAND COMMERCE"**

SOLVES THE  
HEAVY TRUCKING  
PROBLEM



SEND FOR CATALOGUE

**KNOX AUTO CO.,** SPRINGFIELD, MASS.

## "THE WELDING" COMPANY

SPRINGFIELD BOSTON HARTFORD HOLYOKE  
BRIDGEPORT SALEM

All Parts of Any Metal Welded and Guaranteed  
ALUMINUM CASES AND CAST IRON CYLINDERS A SPECIALTY

The Easiest Riding  
Car in the  
World

# MARMON

Thoroughly expressive of the  
highest development of auto-  
mobile design, materials and  
construction.

NEW SERIES MARMON "32" F. E. WING MOTOR CAR CO.  
\$2850 to \$4100 "Motor Mart"  
THE MARMON SIX 12 Columbus Ave., BOSTON  
\$5000 to \$6350 New England Dealers for  
NORDYKE & MARMON CO., Indianapolis, Ind.

## MOTOR PARTS COMPANY

OFFICIAL

### BOSCH DISTRIBUTOR

Zenith Carburetor Mohawk Tires Leak-Proof Rings

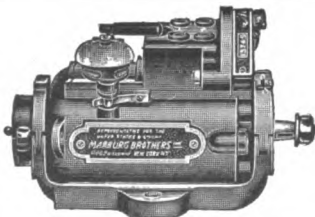
185-187 Columbus Avenue, BOSTON  
818 No. Broad St., PHILADELPHIA SPRINGFIELD, MASS.

# GOOD YEAR

AKRON, OHIO

This name on Automobile Tires and Rubber Accessories  
signifies inherent qualities of material and workmanship that  
insure the maximum of service at the minimum of expense.

THE GOODYEAR TIRE & RUBBER COMPANY, AKRON, OHIO (672)



*Mea*

Magneto

S. R. O. BALL  
BEARING

**MARBURG BROS., Inc.,**

Sole Importers

Detroit

1790 Broadway, New York

Chicago

## (BUYERS' GUIDE—Continued.)

**BLOW-OUT PATCHES.** (See Patches.)

**BODIES, TRUCK.**

**Motor Truck Body Co.,** 320 Franklin St., Detroit.

**BODIES—WOOD AND METAL.**

**Springfield Metal Body Co.,** 20 Medford Ave., Springfield, Mass.

**BRAKE BANDING OR LINING.**

**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City. (J-M Non-Burn.)

**Royal Equipment Co.,** The, 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)

**Standard Woven Fabric Co.,** Framingham, Mass. (Multibestos.)

Branches: 903 Boylston St., Boston; 276 Canal St., New York; 720 Main St., Buffalo; 422 River St., Troy, N. Y.; 1427 Vine St., Philadelphia; 1430 Michigan Blvd., Chicago; 1598 Woodward Ave., Detroit; St. Louis; San Francisco.

**BRAKES.**

**Royal Equipment Co.,** The, 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)

**BRUSHES, WIRE.**

**Williams Foundry & Machine Co.,** Akron, O.

**BUMPERS AND FENDERS.**

**Cox Brass Mfg. Co.,** Dudley Ave., Albany, N. Y.  
**Sager Co.,** J. H., 271 South Ave., Rochester, N. Y.

**CABLES.** (See Wires.)

**CARBON REMOVERS.** (See Cylinder Cleaning Compound.)

**CARBURETORS.**

**Planhard Mfg. Co.,** 1790 Broadway, New York. (Planhard.)

**CARS—ELECTRIC PLEASURE.**

**Anderson Electric Car Co.,** 458 Clay Ave., Detroit. (Detroit Electric.)

**Baker Motor Vehicle Co.,** Cleveland. (Baker.)

**CARS—GASOLINE PLEASURE.**

**Austin Automobile Co.,** Grand Rapids, Mich. (Austin.)

**Cartercar Co.,** Pontiac, Mich. (Cartercar.)

**Cole Motor Car Co.,** Indianapolis, Ind. (Cole.)

**Empire Automobile Co.,** Indianapolis, Ind. (Empire, Little Aristocrat.)

**Haynes Automobile Co.,** 166 Main St., Kokomo, Ind. (Haynes.)

**Henderson Motor Car Co.,** Indianapolis. (Henderson.)

**Herreshoff Motor Co.,** 620 Harper Ave., Detroit. (Herreshoff.)

**Jackson Automobile Co.,** 1400 Main St., Jackson, Mich. (Jackson.)

**Keeton Motor Co.,** Detroit. (Keeton.)

**Kissel Motor Car Co.,** 174 Kissel Ave., Hartford, Wis. (KisselKar.)

**Knox Automobile Co.,** Springfield, Mass. (Knox.)

**Maxwell Motor Co.,** Inc., Detroit. (Maxwell.)

**Mercer Automobile Co.,** 1100 Whitehead Road, Trenton, N. J. (Mercer.)

**Michigan Motor Car Co.,** 147 Lay St., Kalamazoo, Mich. (Michigan.)

**National Motor Vehicle Co.,** 1033 22d St., Indianapolis. (National.)

**Nordyke & Marmon Co.,** Indianapolis. (Marmon.)

**Owen & Co.,** R. M., 19 W. 62d St., New York City. (Reo.)

**Paige-Detroit Motor Car Co.,** Detroit. (Paige.)

(Continued on Next Page.)

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## (BUYERS' GUIDE—Continued.)

**Pierce-Arrow Motor Car Co.**, Buffalo, N. Y. (Pierce-Arrow.)  
**Reo Motor Car Co.**, Lansing, Mich. (Reo.)  
**Stutz Motor Car Co.**, Indianapolis. (Stutz.)  
**White Co.**, The, 828 E. 79th St., Cleveland. (White.)  
 Branches: 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.  
**Willys-Overland Co.**, Toledo, O. (Overland.)

## CARS—STEAM PLEASURE.

**White Co.**, The, 828 E. 79th St., Cleveland. (White.)  
 Branches: See Cars—Gasoline Pleasure.

## CARS—GASOLINE COMMERCIAL.

**Adams Bros. Co.**, Findlay, O. (Adams.)  
**Bessemer Motor Truck Co.**, Grove City, Penn. (Bessemer.)  
**Blair Mfg. Co.**, Newark, O. (Blair.)  
**Brown Commercial Car Co.**, Peru, Ind. (Brown.)  
**Cartercar Co.**, Pontiac, Mich. (Cartercar.)  
**Dart Manufacturing Co.**, Waterloo, Ia. (Dart.)  
**Driggs-Seabury Ordnance Corp.**, Sharon, Penn. (Vulcan.)  
**Federal Motor Truck Co.**, Junction and Leavitt Sts., Detroit. (Federal.)  
**Garford Co.**, Elyria, O. (Garford.)  
**General Motors Truck Co.**, 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)  
 Branches: New York, Chicago, Boston, Philadelphia, Kansas City.  
**Gramm-Bernstein Co.**, Lima, O. (B. A. Gramm's.)  
**Knox Automobile Co.**, Springfield, Mass. (Knox and Martin Tractor.)  
**Owen & Co.**, R. M., 19 W. 62d St., New York City. (Reo.)  
**Pierce-Arrow Motor Car Co.**, Buffalo, N. Y. (Pierce-Arrow.)  
**Reo Motor Car Co.**, Lansing, Mich. (Reo.)  
**Sullivan Motor Car Co.**, 1707 East Ave., Rochester, N. Y. (Sullivan.)  
**Willys-Overland Co.**, Toledo, O. (Overland.)

## CARS—ELECTRIC COMMERCIAL.

**Anderson Electric Car Co.**, 458 Clay Ave., Detroit. (Detroit Electric.)  
**Atlantic Vehicle Co.**, Factory, Newark, N. J.; 1600 Broadway, New York City; 10 Postoffice Sq., Boston. (Atlantic.)  
**Baker Motor Vehicle Co.**, Cleveland. (Baker.)  
**Couple-Gear Freight-Wheel Co.**, 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)  
 Branches: 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.  
**General Motors Truck Co.**, 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)  
 Branches: See Cars—Gasoline Commercial.  
**General Vehicle Co.**, Long Island City, N. Y. (G. V.)

## CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

**Cartercar Co.**, Pontiac, Mich. (Cartercar.)  
**Couple-Gear Freight-Wheel Co.**, 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)  
 Branches: See Cars—Electric Commercial.  
**Knox Automobile Co.**, Springfield, Mass. (Knox and Martin Tractor.)  
**White Co.**, The, 828 E. 79th St., Cleveland. (White.)  
 Branches: See Cars—Gasoline Pleasure.  
**Willys-Overland Co.**, Toledo, O. (Overland.)

## CATALOGUE SYSTEMS.

**Catalogue Systems Co.**, Fisher Bldg., Chicago, Ill.

## CEMENTS.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.

(Continued on Next Page.)

## J. M. Shock Absorber

Wherever you see  
fine automobiles—in  
America or abroad—  
look at the rear springs!



The overwhelming preference of discriminating automobilists for

## J. M. SHOCK ABSORBERS

You can see with your own eyes this conclusive evidence that no automobilist looking for comfort and economy of operation should overlook the J. M. Shock Absorber.

If you want further proof—send for the Ovington Data Chart "D." It tells in simple, graphic lines drawn by the car itself, the remarkable efficiency of J. M. Shock Absorbers on roads of all types, from the rough country lane to the finest boulevard.

Here is real proof—not mere claims.

It is yours for the asking.

The limited edition of these charts is rapidly being exhausted.

Write for your copy at once.

## The J. M. Shock Absorber Co.

(Incorporated)

210 S. 17th Street, Philadelphia

AGENCIES: New York, N. Y., 218 W. 84th St.; Chicago, Ill., 1509 Michigan Ave.; Cincinnati, O., 801 Main St.; Buffalo, N. Y., Teck Building; Rochester, N. Y., 111 Monroe Ave.; Atlantic City, N. J., 12 S. Virginia Ave.; Cleveland, O., 5906 Euclid Ave.; St. Louis, Mo., 3029 Locust St.; Boston, Mass., 222 Elliot St.; Pittsburgh, Pa., 5919 Baum St.; Baltimore, Md., 10 W. Eager St.; Washington, D. C., 1803 M St., N. W.; Hartford, Conn., 230 Main St.; Los Angeles, Cal., 1256 S. Flower St.; San Francisco, Cal., Van Ness Ave. and Jackson St.; Jacksonville, Fla., 200 Lauro St.; Syracuse, N. Y., State and Cedar Sts.; Providence, R. I., 11 Dorrance St.; Erie, Pa.; Seattle, Wash.; Portland, Ore.; Orlando, Fla.

Foreign Branches in France, England, Germany, Russia, Belgium, Austria, Italy, Spain, Argentine Republic, South Africa and Australia

*Look at the rear springs*

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## SAGER EQUALIZERS

The Shock Absorbers Which Save Your Car and Tires.  
Nothing to Wear, Adjust or Require Attention.  
They Take The "Sting" Out of Rough Roads.  
Try Them At Our Expense For 30 Days.

**Seven Years Of Success.**

ENDORSED BY:

Stoddard-Dayton  
Elmore  
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Saurer  
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Maxwell  
Autocar  
Kissel-Kar  
Dorris  
Logan  
Crawford  
Meteor  
and Jewel

**THOUSANDS OF DOLLARS**

Saved Annually by Use of Sager Bumpers.  
Don't Wait for a "Smash-up" to Buy Protection.  
**DO IT NOW.**

**PRICES \$6.00 to \$27.50.**

Diamond

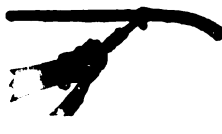


Used Almost Exclusively On High Grade Cars.  
Channel

Liberal Discounts.  
Protection



Rochester



Clamped on Bumpers of Distinction. 30 Models. Attached in 10 Minutes.  
**FORD SPECIAL, CLAMPED ON, \$10.**

**J. H. SAGER CO.**

271 South Avenue, Rochester, N. Y.

## Cartercar

With the gearless transmission—will give better service than is possible for a gear car. Unlimited speeds—climbs steep hills—gives double the usual tire mileage.

**CARTERCAR COMPANY, Pontiac, Mich.** Send for catalog

**PAIGE** "36"—\$1275  
"25"—\$ 950

Leaders of popular-priced cars—thoroughly built, completely equipped, backed by a strong organization. Specifications and catalog on request.

**PAIGE-DETROIT MOTOR CAR CO.**  
306 21st Street, Detroit, Michigan

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## (BUYERS' GUIDE—Continued.)

Northwestern Chemical Co., Marietta, O. (Se-ment-ol Radiator.)

### CHAINS, TIRE, AND ANTI-SKIDDING DEVICES.

Weed Chain Tire Grip Co., 28 Moore St., New York.

### CHAINS—TRANSMISSION OR DRIVING.

Boyd, F. Shirley, 903 Boylston St., Boston. (Baldwin.)  
Miller, Chas. E., 97-103 Reade St., New York. (Brampton.)

Branches: See Accessory Manufacturers and Jobbers.)

### CLOCKS FOR DASHBOARDS, ETC.

Boston Clock Co., 16 State St., Boston.  
Chelsea Clock Co., 16 State St., Boston.

### CLUTCHES—AUTOMOBILE FRICTION.

Bretz Co., J. S., 250 W. 54th St., New York. (Hartford Cone.)

### COILS.

Heinze Electric Co., Lowell, Mass.  
New York Coil Co., 338 Pearl St., New York City.

### CONTROLLERS AND ECONOMIZERS.

M&M Sales Co., Lewistown, Penn. (M&M.)

### CYLINDER CLEANING COMPOUND.

Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.  
Milwaukee Auto Specialty Co., 128 Second St., Milwaukee.  
Northwestern Chemical Co., Marietta, O. (Carbonox.)  
Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Carbon Remover.)  
Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

### FIRE EXTINGUISHERS.

Northwestern Chemical Co., Marietta, O. (Fire-Fly.)  
Pyrene Co. of New England, 176 Federal St., Boston.

### FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

### GASKETS AND GASKET CUTTERS.

Brown Co., Inc., Chas. D., 49 Federal St., Boston. (Velumoid.)  
Shawver Co., Springfield, O.

### GAUGES.

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Tire Pressure and Gasoline Tank.)  
Branches: In all principal cities.

### GEARS, STEERING.

Ross Gear & Tool Co., 794 Heath St., Lafayette, Ind.

### GUNS, GREASE. (See Oil Pumps.)

### HORNS.

Dean Electric Co., Elyria, O. (Tuto.)  
Motor Specialties Co., 2 Cooper Lane, Waltham, Mass. (Fogg.)

(Continued on Next Page.)



(BUYERS' GUIDE—Continued.)

HOUSES, PORTABLE STEEL.

Kelb Sales Co., 1790 Broadway, New York. (Ruby.)

INSULATION.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

JACKS, ETC.

Shawver Co., Springfield, O.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)  
Branch: 1974 Broadway, New York.

LICENSE NUMBER BRACKETS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.  
Branches: In all principal cities.

LIGHTING SYSTEMS, ELECTRIC.

Apple Electric Co., Dayton, O. (Aplco.)  
Dean Electric Co., Elyria, O. (Dynalux.)  
Remy Electric Co., Anderson, Ind. (Remy.)

LOCKS, AUTOMOBILE.

Bracelet Auto Lock Co., 32 No. Clark St., Chicago.

LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York. (Colonial.)  
Branches: Boston, Fall River, Philadelphia.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagle-line No-Karbon.)

Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)  
Branch: 143 No. Wabash Ave., Chicago.

Mawz, Geo. A., 142-144 Front St., New York. (Panhard.)  
Branch: 899 Boylston St., Boston.

Indian Refining Co., 17 Battery Place, New York. (Distributors of Havoline Oil.)

Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Building, Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.

Invader Oil Co., 80 Broad St., New York. (Invader.)  
Branches: 234 Columbus Ave., Boston; 113 Arch St., Philadelphia; 3556 11th St., N. W., Washington, D. C.

Miller, Chas. E., 97-103 Reade St., New York. (Pan-American.)

Branches: See Accessory Manufacturers.

New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)

Northwestern Chemical Co., Marietta, O. (Gear-Silence.)

Standard Oil Co., New York. (Polarine.)

Branches: In all cities.

Texas Company, The, 7 West St., New York.

Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)

Branches: 49 Federal St., Boston; 29 Broadway, New York; Fourth and Chestnut Sts., Philadelphia; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.; Fisher Bldg., Chicago; Ford Bldg., Detroit; Indiana Pythian Bldg., Indianapolis.

Valvoline Oil Co., 27 State St., Boston. (Valvoline.)

MAGNETOS AND SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York.

Branches: 119-121 E. 24th St., Chicago; 1250 Wood-

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## The Grip That Doesn't Slip

is the grip J-M Non-Burn Brake Lining takes when brakes equipped with it are applied. It stops a car almost instantly in emergencies—gradually when desired.

Made of Asbestos interwoven with strong brass wires,

## J-M NON-BURN BRAKE LINING

insures quick and positive action of brakes and gives you safe and sure control of car. Frictional heat, water, grease or gasoline cannot injure this lining or impair its gripping power. Outwears twelve ordinary linings.

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FIVE MODELS - \$2750 to \$3400

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Electric Lights

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Manufacturers and Jobbers

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An absolutely fireproof building, neat in appearance, with the strength of a skyscraper. Can be erected during your spare time. Small touring car size \$120. Other sizes in proportion. All of our buildings carry a fifteen year bank bond guarantee. Steel buildings for every purpose.

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United States Rubber Bldg.  
NEW YORK



100% EFFECTIVE



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1926 BROADWAY

NEW YORK

Canadian Agency: 325 St. James Street, Montreal.

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### THREE GREAT MODELS

Pilot 50---4 cylinder, 4 1-2x6---59 H. P., 120 inch wheel base, roadster and touring car---\$2250. Pilot 50---Roadster---4, 6 and 7 passenger bodies, 126 inch wheel base---\$2500. Pilot 60---6 cylinder, 4x8, brake test 67 H. P., 132 inch wheel base, roadster---4, 6 and 7 passenger touring cars---\$2785.

### The Car Without a Mechanical Defect

Teetor "T" head motors, full floating rear axles, Brown-Lipe differential, Warner transmission, Elsemann Magneto, Carter Carburetor, handsome jewel bodies with ventilating windshield. Completely equipped, with every convenience and comfort. Dynamo electric lighting and electric starter (Gray & Davis system), power tire pump. We have the greatest agency proposition in the United States. Write for our beautiful art book showing cars in detail.

**PILOT CAR SALES CO.,** Richmond, Indiana

## MAXWELL MOTOR COMPANY (Inc.)

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ward Ave., Detroit; 357 Van Ness Ave., San Francisco.  
Brets Co., J. S., 250 W. 54th St., New York. (U. & H.)  
Heinze Electric Co., Lowell, Mass. (Heco.)  
Marburg Bros., 1790 Broadway, New York. (Mea.)  
Remy Electric Co., Anderson, Ind. (Remy.)  
Splittdorf Electrical Co., 98 Warren St., Newark, N. J.  
Branches: 10-20 W. 63rd St., New York; 1110 S. Michigan Ave., Chicago; 180-182 Massachusetts Ave., Boston; 1028 Geary St., San Francisco; 972 Woodward Ave., Detroit; 1228 S. Olive St., Los Angeles, Cal.; S. W. Corner Cherry and Juniper Sts., Philadelphia; 1823 Grand Ave., Kansas City; 1628 Broadway, Seattle, Wash.; London, Eng.; Buenos Aires.

### MASTER VIBRATORS.

New York Coll Co., 338 Pearl St., New York City.

### MEASURES.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Auto and Savol.)

### MIXING DEVICES, GASOLINE.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

### MOTORCYCLES AND SUPPLIES.

Miami Cycle & Manufacturing Co., 320 Hanover St., Middletown, O. (Flying Merkel.)

### MOTOR STARTERS.

Apple Electric Co., Dayton, O. (Aplco.)  
Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.  
Remy Electric Co., Anderson, Ind. (Remy.)

### PACKING, FIRE.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

### PAINT, ANTI-RUST.

Anti-Rust Paint Co., Dept. 7, Akron, O. (Thomas.)  
Northwestern Chemical Co., Marietta, O. (Never-Rust.)

### PATCHES.

Invincible Puncture Proof Tire Co., 53 Sabin St., Providence. (Invincible.)  
National Motor Supply Co., 1911 Euclid Ave., Cleveland.

### POLISH.

International Metal Polish Co., Quill St. and Belt R., Indianapolis, Ind. (Blue Ribbon.)  
Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.  
Northwestern Chemical Co., Marietta, O.

### PRIMERS.

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Brown Co., Syracuse, N. Y. (Brown Impulse.)  
Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.  
Dewey-Anderson Co., Toledo, O. (Dewey Power.)  
Shawver Co., Springfield, O.

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Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

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Boyd, F. Shirley, 903 Boylston St., Boston. (Dorian.)  
Firestone Tire & Rubber Co., Akron, O.  
Branches: In all principal cities.  
Standard Welding Co., Cleveland. (Stanweld.)  
United States Tire Co., Broadway and 58th St., New York. (Continental and Whittlesey Demountable.)  
Branches: New York, Chicago, San Francisco.

**ROAD BUILDING MATERIALS.**

Barrett Manufacturing Co., New York. (Tarvia.)  
Branches: Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburg, Cincinnati, Kansas City, Minneapolis, New Orleans, Seattle, London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

**SHIELDS, MOTOR.**

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (Asbestos.)

**SHIMS, ETC.**

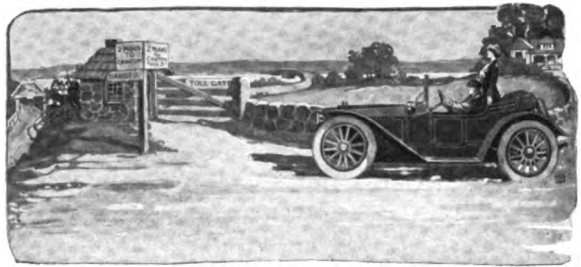
Rhineland Machine Works Co., 140 W. 42nd St., New York City. (Lindhe Laminated.)  
Branches: See Balls and Ball Bearings.

**SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.**

Boyd, F. Shirley, 903 Boylston St., Boston.  
Hudson Export and Import Co., 140 W. 42nd St., New York City. (A. V.)  
J. M. Shock Absorber Co., 210 So. 17th St., Philadelphia. (J. M.)  
Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

**SOAPS.**

Hopewell Bros., Newton, Mass. (Paos.)  
Branch: 1974 Broadway, New York.  
Northwestern Chemical Co., Marietta, O. (Dermalene.)  
(Continued on Next Page.)



**WHICH ROAD—**The highway at a trifling toll or the by-way with its deadly risks?

**You're not the man to hesitate!**

Nor can you debate long in choosing lubricants when the same fear, the same certainty of wear and tear attend the use of greases which save (?) a few nickels when you buy.

YOU can afford to use



TRADE MARK  
**NON-FLUID OIL**  
REGISTERED IN  
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UNITED STATES

at a little higher price per can when you secure the smooth, open road to long life for your car and the satisfaction of mindease about your bearings.

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**You're not the man to hesitate!**

Be sure you get genuine NON-FLUID OIL, packed in orange colored cans bearing the above Trade Mark.

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**BALL BEARINGS**  
*"INSURANCE FOR BUILDER AND USER"*  
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**Thousands of Car Owners All Over the World  
 Are Using Blue Ribbon Goods**



Blue Ribbon Metal Polish  
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All BLUE RIBBON products strictly high class and fully guaranteed. BLUE RIBBON moves quick for the dealer—works fast for the consumer.

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Final and crowning achievement of R. E. Olds, pioneer designer of autos. A standard size 30 to 35 Horsepower four cylinder car of modern refinements priced at only \$1,095.

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**PLANHARD CARBURETOR**

When you insist upon having a carburetor that will give increased power and speed, automatic action, perfect control, and will pay for itself in gasoline saved,

It will be a Planhard. Book upon request.

PLANHARD MFG. CO. 1790 Broadway, New York

**PERFECTION SPRING COMPANY**



High-Grade  
 Pleasure Car  
 and Motor  
 Truck Springs

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STARTS—LIGHTS—IGNITES

Six Volt System Does It All.  
 Write for our magneto exchange offer.

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**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.  
**Mosler, A. R., & Co.**, P. O. Box M, Mt. Vernon, N. Y. (Spit Fire.)  
**Rhineland Machine Works Co.**, 140 W. 42nd St., New York City.  
 Branches: See Balls and Ball Bearings.  
**Splitdorf Electrical Co.**, 98 Warren St., Newark, N. J.  
 Branches: See Magnetos and Magneto Supplies.  
**Standard Co.**, The, Torrington, Conn. (Black Eagle.)

**SPARK PLUG TERMINALS.**

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**Hoffecker Co.**, The, Motor Mart, Boston. (Hoffecker.)

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Branches: Broadway and 76th St., New York; 109 Massachusetts Ave., Boston; 1416 Vine St., Philadelphia; 1430 Michigan Ave., Chicago; 852 Main St., Buffalo; 253-255 Jefferson Ave., Detroit; 530 Golden Gate Ave., San Francisco; 1229 So. Olive St., Los Angeles, Cal.; 329 Ankeny St., Portland, Ore.; 917 E. Pike St., Seattle, Wash.

**Northwestern Chemical Co.**, Marietta, O. (Hydrometers and Thermometers.)

**Service Recorder Co.**, 2245 East 105th St., Cleveland. (Servis.)

**Stewart-Warner Speedometer Corp.**, Chicago. (Auto-Meter.)

Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330 1/2 North Illinois St., Indianapolis; 1613 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia; 5940 Kirkwood Ave., Pittsburgh; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

**SPRINGS FOR AUTOMOBILE SUSPENSION.**

**Marburg Bros., Inc.**, 1790 Broadway, New York. (Marburg-Hagen.)

**Perfection Spring Co.**, No. 1 Plant, 2414 Superior Ave., N. W.; No. 2 Plant, East 65th and Central Ave., Cleveland.

**SPROCKETS.**

**Boyd, F. Shirley**, 903 Boylston St., Boston. (Baldwin.)

**STEEL PARTS, SEAMLESS.**

**Standard Welding Co.**, Cleveland.

**STORAGE SYSTEMS—GASOLINE AND OIL.**

**Sealife & Sons Co.**, Wm. B., Pittsburg, Penn.  
 Branch: New York City.

**TANKS, ACETYLENE GAS.**

**Prest-O-Lite Company**, 271 East South St., Indianapolis. (Prest-O-Lite.)

Branches: See Cylinder Cleaning Compound.  
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## TANKS FOR FUEL AND WATER.

**Sealife & Sons, Wm. B.,** Pittsburg, Penn.  
Branch: New York City.

## TANKS, TIRE INFLATING.

**Prest-O-Lite Co.,** 271 East South St., Indianapolis  
(Baby Tire Filler, The Emancipator.)  
Branches: See Cylinder Cleaning Compound.

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**Johns-Manville Co.,** H. W., Madison Ave. and 41st St.,  
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**Dover Stamping & Mfg. Co.,** Cambridge, Mass.

## TIRE ACCESSORIES.

**Cox Brass Mfg. Co.,** Dudley Ave., Albany, N. Y. (Holders.)

**Firestone Tire & Rubber Co.,** Akron, O.  
Branches: See Rims—Removable and Detachable.  
**Shawver Co.,** Springfield, O. (Tools.)

## TIRE CASES.

**Hopewell Brothers,** Newton, Mass. (Hopewell.)  
Branch: 1974 Broadway, New York.

## TIRE CHAIN GRIPS. (See Chains.)

## TIRE PRESERVATIVES AND PROTECTORS.

**Northwestern Chemical Co.,** Marietta, O. (Tire-Lac.)

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**Braender Rubber & Tire Co.,** Rutherford, N. J.  
(Braender.)

**Cataract Rubber Co.,** Wooster, O. (Cataract.)  
Branches: Boston, New York, Providence.

**Dayton Rubber Mfg. Co.,** Dayton, O. (Dayton Airless.)  
**Firestone Tire & Rubber Co.,** Akron, O. (Firestone.)  
Branches: See Rims—Removable and Detachable.

**Gaulois Tire Co.,** 1926 Broadway, New York. (Gaulois.)  
**Goodyear Tire & Rubber Co.,** Madison St., Akron, O.  
(No-Rim-Cut.)  
Branches: In all principal cities.

**United States Tire Co.,** Broadway and 58th St., New  
York. (Continental, G & J, Hartford, Morgan &  
Wright.)  
Branches: See Rims—Removable and Detachable.

## TIRES—CUSHION.

**Cataract Rubber Co.,** Wooster, O. (Cataract.)  
Branches: Boston, New York, Providence.

**Firestone Tire & Rubber Co.,** Akron, O. (Firestone.)  
Branches: See Rims—Removable and Detachable.

**Motz Tire & Rubber Co.,** The, Akron, O. (Electric  
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Branches: Boston, New York, Philadelphia, Pitts-  
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Angeles.

## TIRES—SOLID AND COMMERCIAL.

**Firestone Tire & Rubber Co.,** Akron, O.  
Branches: See Rims—Removable and Detachable.

**Goodrich Co.,** B. F., Akron, O. (Goodrich.)  
**Motz Tire & Rubber Co.,** The, Akron, O. (Motz.)  
Branches: See Tires—Cushion.

**Polack Tyre and Rubber Co.,** 246 W. 59th St., New York  
City. (Polack.)

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## You'll Make No Mistake

if you say Colonial—and insist on  
having it—because it's an oil that  
can be depended upon, made by a  
firm with a reputation of over thirty  
years' standing  
for high-class  
products.



Use COLONIAL and  
NOTE the DIFFERENCE

## COLO GREASE

*A real transmission grease*  
Will make your gears run  
smoothly and quietly be-  
cause it is made especially  
for gear lubrication.

## COLONIAL

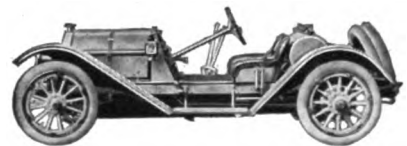
## Timing Gear Oil

overcomes all trouble with  
your timing gear. Use it  
and NOTE the DIFFER-  
ENCE.

## SILEX GREASE

*The greasiest grease made*  
The real test of a grease is  
not its looks or the feeling  
but its lubricating prop-  
erties. SILEX is made to  
lubricate and last.

Type 35  
Series J  
Raceabout  
Guaranteed  
Speed—Mile in  
51 Seconds



## MERCER

The car which most perfectly meets the medium weight  
demand. Dealers should carefully consider this fact.

Write today regarding unallotted Territory.

**MERCER AUTOMOBILE CO.,** 1100 Whitehead Road  
TRENTON, N. J.

## BRAENDER TIRES &amp; TUBES

Are of the highest quality and the cheapest on mileage. They are  
built to last. Send for price list and particulars.

**BRAENDER RUBBER & TIRE CO.**

Main Office and Factory RUTHERFORD, N. J.

## VALVOLINE OIL CO.

Heavy, Medium and Light  
**Automobile Oils**

27 STATE STREET, BOSTON, MASS.





**HECO-Magnetos**

**INSURE  
A STEADY SPARK  
AT ANY R.P.M.**

HECO MAGNETOS are the product of experts specialized in the electrical business. They embody all that the electrical industry knows about magnetos.

By our special method of winding the secondaries we are able to positively guarantee them against burning out or breaking down.

HECO MAGNETOS supply a spark of equal intensity for any number of revolutions per minute.

We also make the well-known HECO COILS, and HECO COMBINATION PRIMERS and SPARK PLUGS. Let us send you our complete catalog.

**HEINZE ELECTRIC COMPANY**  
Factories and Gen'l Office, Lowell, Mass.  
Sales Office, Detroit, Mich.



**Hoffecker**  
"The Steady Hand"

**Speedometer**

Accurate, durable...the one speedometer with a daily trip register that can be set at any mileage at any time.

**THE HOFFECKER COMPANY**  
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BRANCH OFFICES  
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**F. SHIRLEY BOYD**  
903 Boylston St. Boston, Mass.  
Dorian Demountable Rims.  
Supplementary Spiral Springs. R. I. V. Ball Bearings.

**CAMERON CARS \$975**  
All Up-To-Date Features  
Four cylinder, water cooled, 30 H. P. Four forward speeds. 112 in. wheelbase. Left hand drive, centre control. Starts from seat. Pointed hood, beautiful lines and finish. Equipment unsurpassed at the price.  
Write for full details and terms to agents  
**THE CAMERON MANUFACTURING CO.** Beverly, Mass.

When Writing Advertisers, Please Mention The Automobile Journal.

**(BUYERS' GUIDE—Concluded.)**

**United States Tire Co.,** Broadway and 53th St., New York.  
Branches: See Rims—Removable and Detachable.

**TOPS AND ATTACHMENTS.**

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**TROUBLE FINDERS.**

**Hopewell Brothers,** Newton, Mass. (Vibrator.)  
Branch: 1974 Broadway, New York.

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**Brets Co.,** J. S., 520 W. 54th St., New York. (Hartford.)

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**VALVE LIFTERS.**

**Winsor Manufacturing Co.,** Providence, R. I.

**VOLTMETERS—**(See Ammeters.)

**VULCANIZERS.**

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**Autogenous Welding Equipment Co.,** Springfield, Mass.

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**Standard Welding Co.,** Cleveland.

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**WIRE MECHANISM.**

**Brets Co.,** J. S., 250 W. 54th St., New York. (Bowden.)

**WRENCHES AND COMBINATION OUTFITS.**

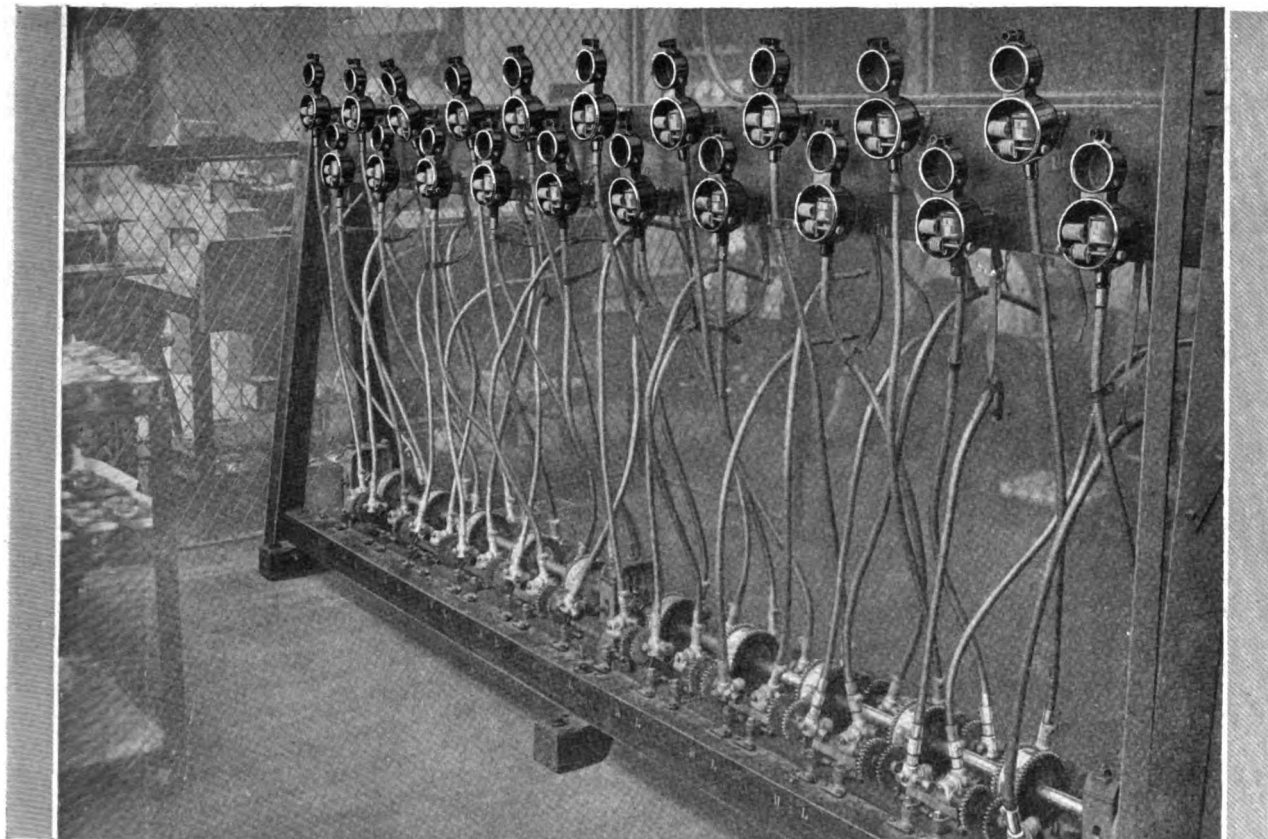
**Allen Wrench and Tool Co.,** Providence, R. I. (Allen Friction Socket Sets.)

**Coes Wrench Co.,** Worcester, Mass.

**Cutter, George A.,** Taunton, Mass.

**Walworth Manufacturing Co.,** Boston. (Stillson.)





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## QUALITY AUTO-METER

### Providing Surplus Speed Capacity

**E**VERY part of every Warner Auto-Meter made must be proven absolutely correct in the most severe speed tests before our expert inspectors pass it for final assembly and shipment.

The specially constructed testing machine shown above is designed for thoroughly trying out every part of the instrument. Sixty miles an hour is excessive motor car speed. This test is made at the rate of 150 miles per hour. Therefore every Warner has a surplus speed capacity of

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No other speedometer on the market is so carefully constructed or subjected to such expensive and scientific tests as the Warner Auto-Meter.

*Service Stations in all important cities all over the world*

**The Warner Auto-Meter Factory, Beloit, Wisconsin**



Corrected to September 1st, 1913  
All Previous Lists Cancelled

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(MADE IN GERMANY)

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FITTED WITH THE RIBBON BALL SEPARATOR AND THE  
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(Both Patented)

If interested, send for Double Annular Type, Ball Thrust Type  
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**NEW SINGLE ANNULAR LIST-**  
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The valuable and handy tables in the pamphlet give the trade number of the bearings, their bore, outer diameter, width, number and size of balls, increased load capacity in pounds at various R. P. M., together with the new list prices on the conventional type and self-aligning type.

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**J. S. BRETZ COMPANY**  
Sole Importers.  
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VOL. XXXVI.

NO. 6.

# AUTOMOBILE JOURNAL

\$1.00 the year  
10 cents the Copy

PAWTUCKET R.I.

October 25, 1913

## HAVOLINE OIL

For Perfect  
Lubrication of  
Automobile



And Marine  
Gasoline Engines

This OIL is NOT AN EXPERIMENT, here today and gone tomorrow, but has for many years maintained the highest reputation as a scientifically prepared lubricant which is properly filtered, so that it burns clean, without leaving carbon deposits on plugs or cylinders.

The biggest engine manufacturers in the East and in the West recommend it; thousands use it on Touring and Racing Automobiles, and Working, Cruising and Racing Motor Boats, and all are pleased to find that

*"It Makes a Difference"*

INDIAN REFINING COMPANY, Inc.  
17 Battery Place  
NEW YORK CITY



**The Largest Automobile Supply House in America**

# The Miller Automobile Jack

The MILLER AUTOMOBILE JACK is a single acting, automatic-lowering jack, designed especially for automobile use and is adapted to the factory or garage as well as to be carried as a part of the equipment on motor cars. The MILLER JACK is constructed of the best material, no complicated or loose fitting parts to get out of order, and in material, workmanship and finish, the MILLER JACK is not exceeded, if indeed, it is equalled by any other jack. It is a high grade and one of the finest finished jacks on the market.

The short stroke makes lifting easy and rapid. Automatically locks while operating, thereby doing away with any possibility of slipping or dropping the load.

Fitted with a simple and convenient trip lever for reversing. Height, 11 inches. Raises 6 inches. Weight, 9 lbs. Capacity, 1 ton.

We guarantee this jack for 12 months, and at the price, it is the best value ever offered to the automobile trade.

We are in a position to quote a special price to manufacturers, jobbers and dealers who buy in quantities.

**CAPACITY: ONE TON.**

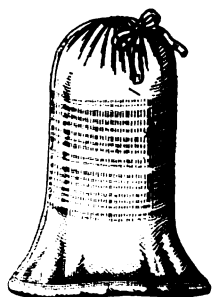
The List Price of the MILLER JACK,  
guaranteed for twelve months.....\$3.00 each

Weight, packed for Parcel Post, 10 lbs.

**AGENTS WANTED. ADDRESS JACK DEPARTMENT.**



**THE MILLER JACK**  
Designed for any size and style of automobile and is adapted for all purposes.



**TUBE BAG**

**25c A REAL INNER TUBE BAG FOR 25c**

**MAILED TO ANYONE IN ANY PART OF THE UNITED STATES  
MADE OF HEAVY NAPPED CLOTH**

Will keep your inner tube free from grit and dirt, and from scratching or chafing while in the tool box or luggage carrier. Answers the same purpose as tube bags which cost \$1.50 or more. Will hold one tube 5 inches or smaller. Protect your tubes and reduce your tire expense. In ordering, state size of tube.

Send 25c. in stamps or coin, and tube bag will be sent to you by return mail

Send your name and address NOW with 4 cents postage (to cover cost of mailing) for a free copy of our Big 256 Page Catalog

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274 Halsey Street



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**WILLARD STORAGE BATTERY CO.**  
Cleveland, Ohio



## No Other "Six" in the World Near this Price

The new Studebaker "Six" stands absolutely alone and apart in the entire field of six-cylinder cars.

At its price of \$1575—less by hundreds than any other "Six," it confers the operative advantages of the "SIX" emphasized and enhanced because this "SIX" is a Studebaker-manufactured "SIX."

It affords passenger capacity for seven.

It brings the manifest advantages of electric lighting and starting through a two-unit system that has proved itself on thousands of Studebaker cars.

Never before has such a car been offered at \$1575.

Today there is not such another car, at this price, in the entire world.

### Six Thousand Manufacturing Operations

How completely the Studebaker "SIX" is the product of the great Studebaker plants you will realize when you know that its construction requires more than 6000 manufacturing operations.

Throughout the rear axle and transmission, and in the front wheels we use 13 Timken roller bearings for quiet, easy running.

In fuel consumption we believe the "SIX" will match, if not surpass, the economy of any car of equal horsepower. Its motor size is  $3\frac{1}{2} \times 5$  inches.

It is economical because, in spite of its 121-inch wheelbase it is light, and easy on its 34x4-inch tires; yet it is wonderfully strong.

### Carries Seven in Comfort

It is generously roomy and richly upholstered, and carries its seven passengers in utmost comfort.

In design and lines, the "SIX" acknowledges no greater beauty and grace.

The starting and lighting system is the Wagner two-unit, starting motor and generator separate.

Lamps are Gray & Davis' highest quality, parabolic type.

In short, the "SIX" lacks nothing in style, beauty or comfort.



Electrically Started  
Electrically Lighted  
Seven-Passenger

## A "Six" That Has a Field All To Itself

The superb new Studebaker "SIX" is a **manufactured** "Six" down to the smallest essential detail.

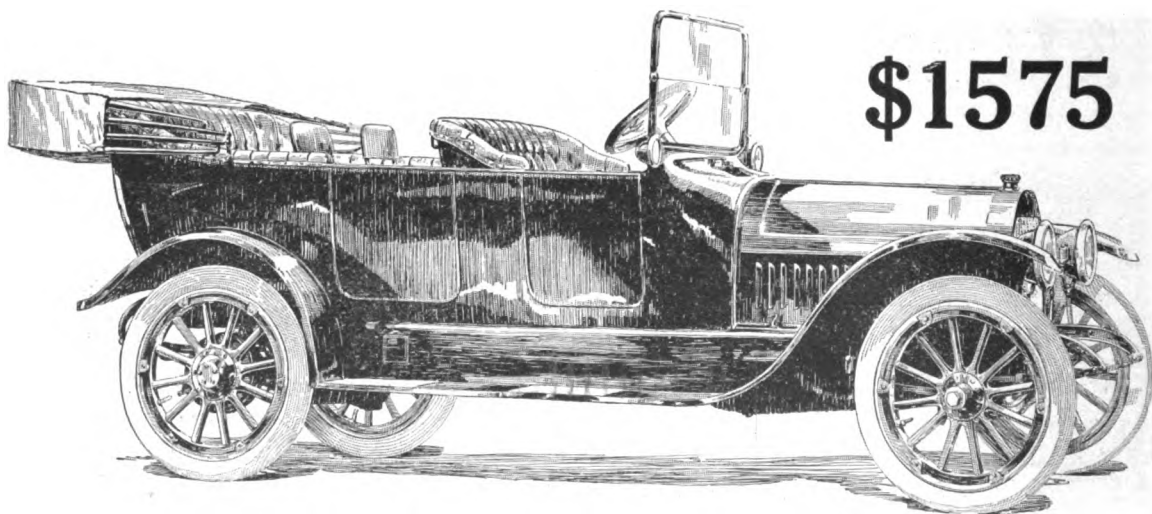
Any other kind of a "Six" we decline to consider in comparison.

In a "Six" you must have manufactured accuracy—every "Six" part must synchronize with every other part.

And—even so—there is no other "Six" either assembled or manufactured, which is even near the Studebaker "Six" in price.

**STUDEBAKER,**

**Detroit, Mich.**



# \$1575

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## Try to Find Another "Four" Like This

We hold fast to our positive convictions concerning this new Studebaker "Four."

We are convinced, to begin with, that you will not find another "four" which compares with it in value.

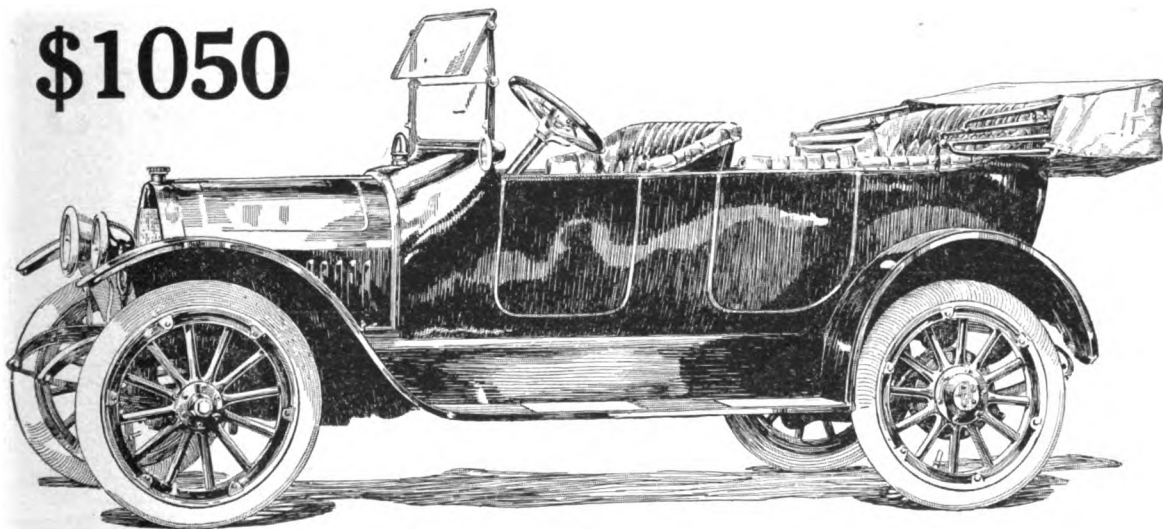
We are convinced that it will eventually compel those above it in price to give more; and those below it, to charge less.

We believe it will cause more changes in ownership among those who have waited for a higher quality to be brought down to this price than any "four" which has preceded it.

STUDEBAKER,

Detroit, Mich.

**\$1050**



### *This "Four" the Final Word Among Four- Cylinder Cars*

This Studebaker "FOUR" has been developed from our experience in building 110,000 "FOURS".

Its price, \$1050, represents the outside limit of price for a "Four", because no "Four" can give more, in actual value or performance, than this one does.

So its price is right. Its capacity is right. Its power is right. It is the right type—the last word among four-cylinder cars.

### **Thirteen Timken Bearings**

Nothing that we can say here will give you an adequate idea of the power possibilities of this car—or of the things of which it is actually capable.

The long-stroke motor presents the latest approved engineering practise—cylinders cast en bloc, valves enclosed, exhaust and intake manifolds integral.

Thirteen Timken bearings reduce friction and wear to the minimum at every point in the transmission and rear axle and in front wheel hubs.

Its rear axle is of the full-floating type, and completely accessible.

The rear springs are full elliptic, very long and easy, and with the lower member suspended beneath the axle.

### **Electric Lighting and Starting**

It has left hand steering and central control.

The electrical starting and lighting equipment is the Wagner two-unit system—

Headlights are Gray & Davis' best quality parabolic lamps.

The windshield is of new design, ventilating, clear vision and rain vision.

Rims are detachable demountable, with one extra rim and tire carriers at the rear.

Electric horn, robe rail and tool box are also furnished with the "four".

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COES

## THE Wrench Supreme

Strength without bulk or clumsiness.

Ease of handling without slipping or bruising.

Perfect balance and right grip

Everything the motorist desires in a wrench is to be found in the "COES" AUTOMOBILE MODEL, and you will never know perfect wrench service until you pin your faith to it.

It stands to reason that the 5 per cent. more you pay for a "COES" wrench goes for 60 per cent. more quality and service—put this wrench in the tool kit and shop. You will get your money's worth.

Send for Literature Now.

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### Coes Wrench Co.

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JOHN H. GRAHAM & CO.,  
118 Chambers St., New York City

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# Overland

## \$950

*Completely Equipped*  
With Gray & Davis electric starter and generator—\$1075  
Prices f. o. b. Toledo

Full electric lights  
Storage battery  
35 horsepower motor  
114-inch wheelbase  
Timken bearings

33x4 O. D. tires  
Clear vision windshield  
Brewster green body  
with light green striping,  
nickel and aluminum

trimmings  
Mohair top, curtains  
and boot  
Stewart speedometer  
Electric horn

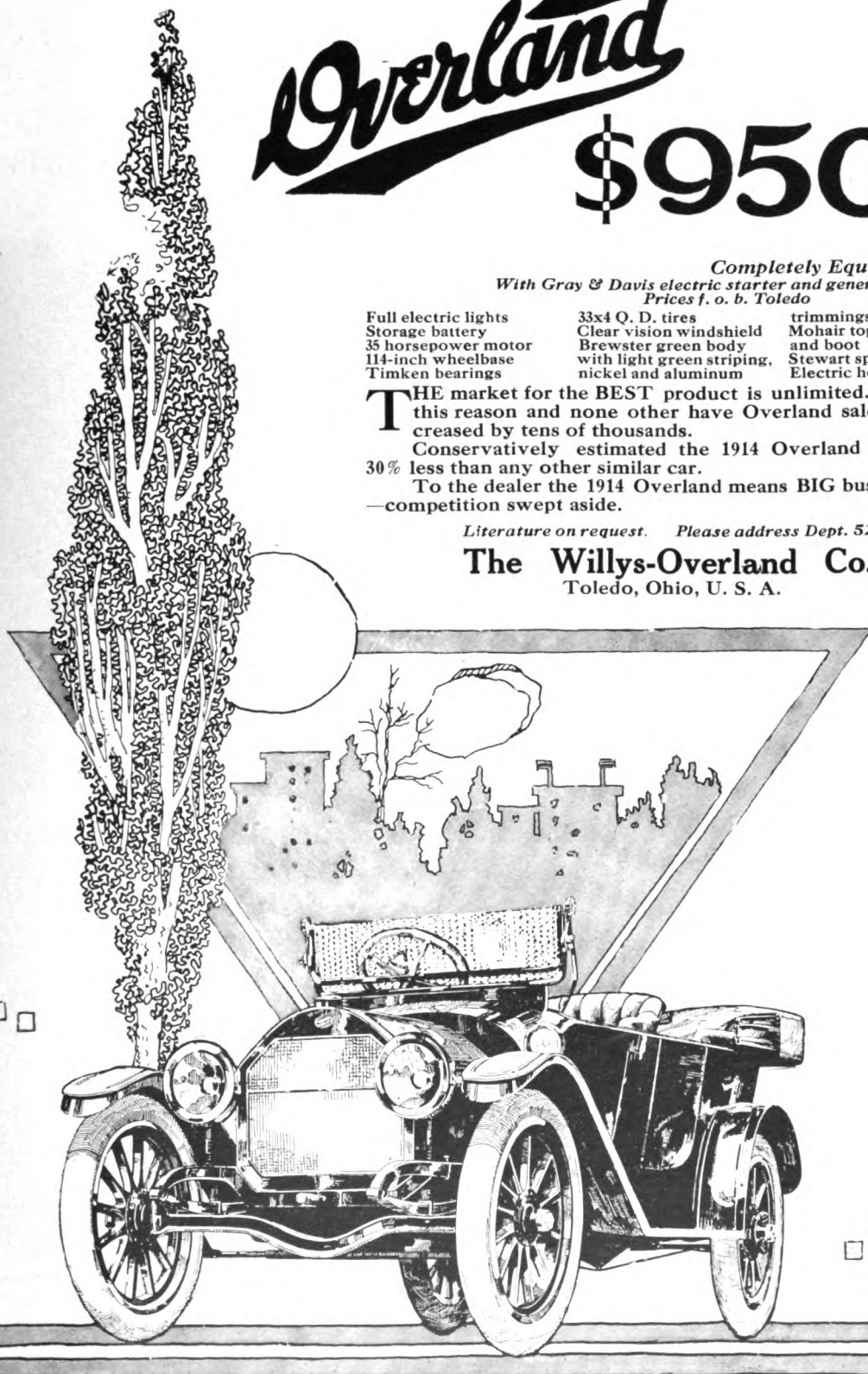
**T**HE market for the BEST product is unlimited. For this reason and none other have Overland sales increased by tens of thousands.

Conservatively estimated the 1914 Overland costs 30% less than any other similar car.

To the dealer the 1914 Overland means BIG business—competition swept aside.

Literature on request. Please address Dept. 52.

**The Willys-Overland Co.**  
Toledo, Ohio, U. S. A.



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|-------------------------------------|--------|------------------------------------|--------|---------------------------------------|--------|
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### JUST COMPLETED AND READY FOR SALE

Motor Truck Construction, Operation, Care and Repair—Right up to the minute . . . . . \$1.00

A B C of Aerial Navigation . . . . . \$1.00

(Working Plans and Specifications of All Standard Models—American and Foreign Motors Described)

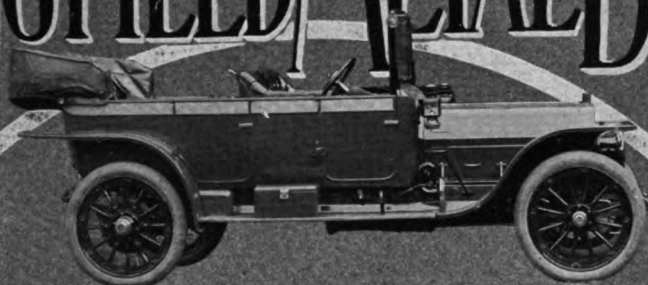
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Times Building,

Pawtucket, R. I.

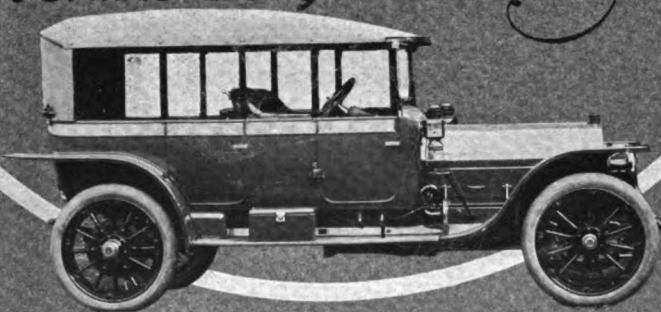


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Springfield Convertible Bodies  
A Construction Giving the  
Qualities of a Limousine & Tour-  
ing Equipment That May Be Con-  
verted as Quickly as a Folding Top  
Can be Raised or Lowered. When  
folded the Full Space of the Touring  
Car is Available — When Raised It  
is a Regular Top or It Can Be Glass  
Enclosed.

Dealers, Who Insist on Quality  
Equipment, Specify The Springfield  
Convertible Body.



## SPRINGFIELD, MASSACHUSETTS

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**A**N intensely interesting story of the season's "one best bet" will soon be told, and it will reverberate from the Atlantic to the Pacific—from the Great Lakes to the Gulf of Mexico—and back again.

Startling as the development of the motor car has been and regardless of the statements that nothing new can be offered in motordom, we must, from necessity, say: "We told you so!" if you do not wait for our announcement about November first.

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*Wait!*

**Moline Automobile Company**  
East Moline, Illinois



## PUBLISHER'S COMMENT.

**The Automobile Journal Is an Owner's Magazine.** More practical information for owners is published in each issue than in all other motoring prints combined. The man who is operating his first car needs expert advice, presented in such terms as to be readily understood and applied. Special attention is directed to a new department in this issue—see pages 42-43-44—and if your particular trouble is not outlined therein, you are invited to make free use of the Correspondence Department on pages 59-60-61.

**Automobile Owners Cannot Afford** to miss the Annual Overhaul and Equipment Number of The Automobile Journal, issue of Nov. 25. Not only will it treat exhaustively with respect to the actual work of overhauling the chassis for winter driving, but it will present every new feature in the list of accessories, supplies and fittings, designed for comfort and convenience, safety and economy in operating the car during the cold weather. You will need this number—the most practical working guide and complete reference book of the season. Order direct, or through your news dealer. No advance in price.

**Keep Well Posted Concerning** the new accessories, supplies and fittings, by watching carefully the section devoted entirely to these on pages 36-37-38. And don't forget to consult the Buyers' Reference and Guide, beginning on page 87, when contemplating purchases of any nature.

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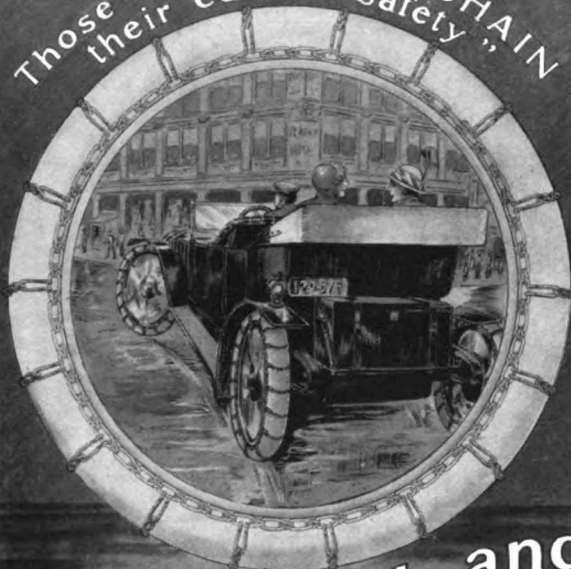
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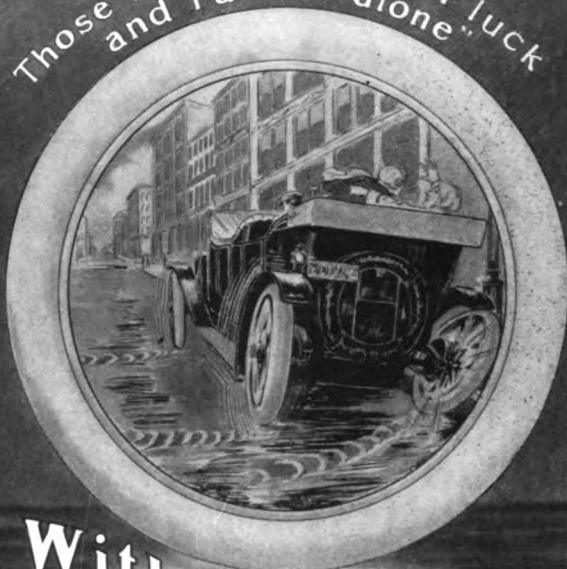


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# THE AUTOMOBILE JOURNAL

VOL. XXXVI, No. 6

OCTOBER 25, 1913

Price, \$1.00 the Year

## FUR VERY POPULAR FOR MOTORING WEAR.

**Designers of Women's Coats Have Been Most Generous in Its Use for the Coming Season--Weather Resisting Mackinaw Shares Favor Among the Men.**

**S**IMPLE and attractive lines mark the offerings in women's motoring apparel for the fall and winter season. For the most part plain colors predominate, and it may be added that the softer tones are much favored. This applies to coats designed for general automobile wear, for there is a wide difference between the garments which are regarded more suitable for limousines and other enclosed cars and those which are intended to protect the wearer from the exposure incident to riding in the touring car or roadster.

The sport coat, which came into favor among motorists last spring, appears to have had its influence upon the winter models, at least, insofar as the length is concerned. The three-quarter coat is quite the rule, particularly for town wear, and it must be admitted that very little long distance riding is undertaken during the winter months. In general, it may be conceded that the garments are roomy, this being

true especially of the back. The tendency toward the belted in model is by no means as strong as earlier in the year.

This is held to be a fur year. Of course, furs always are suitable for motoring wear, and the woman who has occasion to take even infrequent long distance trips feels that she must have a garment, either made of or lined with this material. But this season it is to be noted that even on suits for street wear and sometimes on dresses for indoor occasions, fur trimmings appear in one form or another. This is what is meant by a fur year, and it is utilized rather freely in trimming some of the lighter weight coats for motorists.

A number of distinctive coats for women are presented herewith, the selection covering a wide range, both in material and design. The first model shown is of the new sport length, caracal fur with collar and fancy tab of ermine. Crocheted buttons



**Patrick-Duluth Mackinaw Automobile Robe, Possessing Wind and Weather Resisting Properties.**





**Caracal Fur, Hudson Seal and Worumbo Chinchilla Coats.**

help to carry out the general effect. The lining is of fancy brocaded satin. Worn with this coat is a black velvet hat trimmed with a white ostrich plume, the small bunch of gold grapes on the side serving to relieve the contrasting black and white.

The second model is a three-quarter coat of Hudson seal, with large buttons of the same material. The collar has the deep roll, which is one of the season's features, and it and the deep cuffs are of genuine civet cat fur. This coat also has a brocaded satin lining, and the entire effect is one of warmth and comfort. The hat is a black velvet tam model, edged with the civet cat fur.

The third coat is of Worumbo chinchilla, the significance of the "fur season" again being demonstrated in the small round collar of civet cat.



**Plush Chinchilla, Hudson Seal and Plush Lined Duvetyn.**

The buttons are of ivory, fastened with loops of self material, and the belt, also of self material, finished with buttons, relieves the plain side lines. The hat in this instance also is of black velvet, trimmed with a maltese bow and a rose.

The tendency toward soft tones is well represented in the imported plush chinchilla model seen at the left of the next group. The coat may be worn open at the throat as shown, or turned up closely about the neck. The collar is of the long roll panel design, and the coat is fastened in front with a handsome frog of soutache braid and self material. Deep cuffs add still another touch of warmth. The model is lined throughout with brocaded satin. With this is worn a plain beaver hat.

In the centre of this group is another three-quarter cutaway coat of plain Hudson seal, lined



**Imported Bolivia Cloth, Silk Zibeline and Two-Ton Boucle.**

with brocaded satin. This also has the large roll collar and deep cuffs. The hat is of velvet with a lace rim and presents the new halter about the throat, the plain color being relieved at the side by a pink rose.

The coat at the right is of wool duvetyn, lined throughout with leopard plush, which forms a lapel effect when worn open as shown. The fur appears again in the mink collar and along the top of the cuff. The back is gathered in and held in place with mink trimming. The hat is of velvet, mink faced, and trimmed with a Panone feather.

One of the long coats is shown at the left of the third group. This is of imported Bolivia cloth, with collar and cuffs trimmed with chiffon broadcloth. Buttons are utilized somewhat more freely than with the other models described,



and the buttonholes are piped with the broadcloth. The design is with the so-called paddock effect, and it may be added that the collar may be worn buttoned closely about the neck. The plain tailored silk beaver hat is trimmed with an uncurled ostrich plume.

The coat in the centre is of silk zibeline, with very deep set in sleeves, and the new convertible collar. The fur trimming appears once more in the two-tone boucle coat at the right, this being with opossum collar and cuffs. The sleeves are of the large set in type. A deep fold of self material fastened with large buttons appears at the back. The hat in this instance is of velvet trimmed with silk ribbon and buckle.

Another full length coat is shown at the left of the next group, this being of checked tweed material with the boucle effect. The collar is of moire boucle and the loose set in sleeve termin-



**Short Mackinaw, Browning, King Special and Raglan.**

The deep cuffs and Robespierre collar are of the same material. The coat fastens at the front with a large frog. The hat is a small velvet toque, with a large moire bow fastened with a bead ornament.

The coat in the centre is of raccoon, and conveys a decided impression of warm and long distance touring comfort even in the coldest weather. It has the large roll collar and deep cuffs, and the double-breasted front is fastened with large bone buttons. The hat is a tricorne trimmed with gilt braid.

The last coat presented is of boucle, with brocaded collar and cuffs. A broad seam down either side carries a large number of small buttons, while the front and back are somewhat plain in contrast. The sleeve also is finished with a button. The hat is of black velvet, trimmed with a moire band and a Neumandy tip.

Winter motoring coats for men are designed to present the utmost of comfort and conven-



**Blended Raccoon, Chinchilla and Mackinaw Models.**

ates with a large fancy cuff, trimmed with buttons. Velvet buttons also set off the belt effect at the side and serve to relieve the color scheme.

The shorter coat in the centre is of silk plush with opossum collar in the Robespierre effect. It fastens in front with a long braided silk cord and buttons of self material. The new cutaway effect is noted at the bottom. The lining is of brocaded silk.

Still another long coat is seen at the right, this being of silk camel's hair, with plush and seal trimming. The wide belt at the front and sides is fastened with three large celluloid buttons, which appear again in the back and on the cuffs. The hat is of silk velour, trimmed with opossum and a quill feather.

At the left of the last group is shown a black and white zibeline coat in imitation civet cat.



**Balmain, Scotch Material and Double-Breasted Coats.**



ience. There is a wide range of materials, both in the cloth garments and those in which fur plays an important part. Perhaps the mackinaws



Checked Tweed, Silk Plush and Silk Camel's Hair.

are even more popular than ever, and it may be contended that their popularity is due in no small measure to the quality of the material to resist wind and weather to a remarkable degree. A brief description of the several models shown herewith will serve to indicate the many desirable features among the season's offerings.

At the left of the first group illustrated is a coat of blended raccoon with the shawl collar and deep cuffs, which add materially to the comfort of the wearer when the winds are the sharpest. These cuffs, as, indeed, is true of nearly all the models illustrated, are fitted with the new type of windshield about the wrists, effectually preventing the entrance of cold. The cap is known as the Detroit, a fitting name for an automobile hat, and is of the same material as the coat. The visor and sides pull down, completely protecting the head. The gloves are of buckskin with otter back.

In the centre is a chinchilla automobile coat, also with the shawl collar, which in this instance is buttoned closely about the neck. Large patch pockets and a half-belt in the back serve to relieve the otherwise plain appearance. The cap is an imported Rodol, and is somewhat reminiscent of the head dress worn by aviators. It may be worn with visor and sides folded, but as shown the cape sides are pulled completely around the head, leaving space only for breathing, and the eyes. The latter may be protected still further by lowering the visor.

At the right is a Patrick-Duluth mackinaw, made of the best, long fibre, northern wool, so treated that it is held to resist the effects of rain or snow, even after long exposure. It should not be understood that this means a water proof garment, in the sense that the wearer is absolutely protected from the effects of the weather, but continued use has indicated that the rain resisting qualities are such as to afford protection to a decided degree. This coat is a full length model, with convertible collar and belt effect at the waist, and the cap is of material to match.

Another mackinaw model, by the same maker, is shown at the left of the second group. This is a double-breasted short coat, with the same convertible collar and belt, and might be regarded by some as more suitable for chauffeurs for town use, or for motorcyclists. The cap is of the same material, and has the new inside band, which pulls down over the ears. The leggins are of an imported Spanish design, termed the Toreador, and said to be a style much worn in Cuba and in South America, and one which is proving decidedly popular in America this season.

The coat in the centre is the Browning, King special, and has been designed to meet the desires of those who are seeking something distinctive. It is made of heavy weight material and lined throughout. Knife pleats down the front, sewed down pleats three-quarter way down the back and double-pleated patch pockets serve to break up the plain lines as completely as might



Imitation Clvet Cat, Raccoon and Boucle Models.

be wished, but there are other pleats about the garment, notably the inverted pleats in the skirt.

In sharp contrast to this is the raglan at the



right. It is just a plain raglan, with single-breasted, buttoned through front and convertible collar, but the popularity of these garments is sufficient



**Muskrat Lined Kersey, Belted Back and Russian Dog.**

to permit a wide selection in materials.

Another plain design is seen in the Balmacan automobile coat at the left of the third group. This has the brush collar, the so-called kimono sleeve and the loose fitting back and bell skirt, which cannot help but suggest comfort. The coat in the centre is a single-breasted model of heavy Scotch material, with convertible collar, patch pockets and the half-belt at the back. That at the right is very similar in design, except that it is double-breasted instead of single, and comes in the plain colors.

In the next group are to be seen, from left to right: A muskrat lined kersey model with Persian collar, and cap of seal; a double-breasted cloth coat with patch pockets and belted back, and a wool lined genuine black Russian dog skin with cap to match. The last group presents the following: Wool lined marmot, with shawl collar and deep cuffs; wool lined Russian dog, with raccoon collar, and Worumbo chinchilla coat lined with plaid woolen.

On the opening page of this article is presented one of the Patrick-Duluth mackinaw robes for automobile use. What has been written regarding this material with respect to the coats applies with equal force to the robe. Light in weight and easily handled, its ability to resist cold and dampness makes it a valuable accessory for winter driving. In appearance, it is quite in keeping with all the appointments of a high grade car.

The Automobile Journal is indebted to Cherry & Webb, Providence, R. I., for the illustrations of women's wear shown herewith, and to Brown-

ing, King & Co., New York City, with branches in Chicago, St. Louis, Milwaukee, Cleveland, Cincinnati, Buffalo, Boston, Philadelphia, Providence, Kansas City, St. Paul, Minneapolis and Omaha, for those in which the men appear.

### TO PRODUCE WARREN CARS.

#### New Warren Motor Car Company to Be Organized for This Purpose.

According to information from Detroit, a new Warren Motor Car Company, a close corporation, will be organized to continue the production of Warren cars. A. D. Dunk, president of the Auto Parts Company, is said to be at the head of the new concern, which has purchased the stock of the old Warren company from the Rands Manufacturing Company, which bought it at the recent receiver's sale.

It is stated that the policy of the new company will be to continue the models along the same lines as before, but there will be fewer of them. This is taken to mean there will be but one four-cylinder chassis and one six. It is expected that contracts will be placed with agents this fall, although it is not anticipated that the output for 1914 will be as large as would have been the case had the old company remained a going concern.

The educational department of the Y. M. C. A. at Cleveland, O., has started an automobile class which is very practical in its scope. The course



**Marmot, Russian Dog and Worumbo Chinchilla Cloth.**

includes actual shop practise and individual road work, while written tests on shop and road work are also conducted.



### THE PARTIN-PALMER MODEL.

#### Held to Present a New Standard for Popular Priced Automobiles.

The Partin-Palmer "38", full details of which were presented in The Automobile Journal for Aug. 25, is held to set a new standard for popular priced cars, and to be the first automobile ever built of six-passenger capacity, with 115-inch wheelbase and 38 horsepower motor, to sell at less than \$1000. This is claimed to be possible on account of the complete standardization of parts and the small expense involved where a new company with no big overhead brings the parts together.

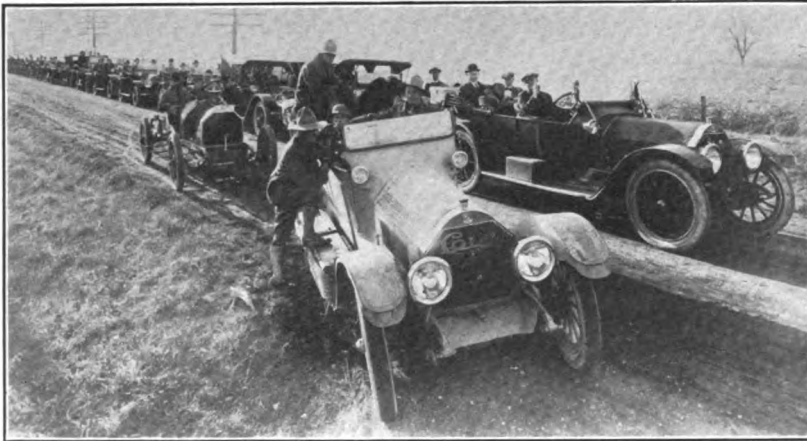
The credit for the designing and production of this machine is due to R. A. Palmer, who was the designer of the Cartercar and was general

enced by a new model. Mr. Crawford was accompanied on the trip by H. C Bradfield, field advertising manager; Lew Pettijohn, chief tester, and the Cole cub, a little black bear, which was picked up somewhere out on the Pacific Coast.

The party, minus the bear, left Indianapolis early in July, a few days after the departure of the members of the Indiana Automobile Manufacturers' Association, which took part in the Indiana-Pacific tour. The car arrived in San Francisco a few hours after the arrival of those tourists. Subsequently, the entire machine was dismantled and the result of the inspection was made public.

Then began a journey northward along the coast into Oregon, Washington and British Columbia. The return trip was made over the northern transcontinental route, conceded to be one of the most difficult sections of the country for automobiles. All told, the party entered 15 states, besides the Canadian points visited.

A large number of Cole owners formed a parade to act as escort for the test car upon its return to Indianapolis, and the photograph reproduced herewith was taken directly after the meeting on the road. The test car is shown in the foreground. Mr. Crawford is at the wheel. Beside him is Joseph Cole, son of President J. J. Cole, who has just been presented with the bear cub. Mr. Bradfield is in the tonneau and



Indianapolis Cole Owners Forming Escort Party to Welcome Home the Six-Cylinder Test Car.

manager of the Cartercar Company for a time. The sales are under the management of C. C. Darnall, general sales manager for the Partin Manufacturing Company, Detroit, and a man of long and successful experience in the automobile industry. The offices of the company are at 29 South La Salle street, Chicago.

### TEST TRIP IS ENDED.

#### Chief Engineer Crawford Returns to Indianapolis with Cole Six.

Having covered 8800 miles during the last three months, Chief Engineer Charles S. Crawford of the Cole Motor Car Company, Indianapolis, Ind., has returned to that city with the 1914 six-cylinder Cole car, which has been given one of the most severe road tests ever experi-

Mr. Pettijohn has one foot on the running board.

The Cole company will again completely dismantle the car, examining every component for wear, etc., and will publish the results of this inspection in book form. In addition, the volume will contain data concerning transcontinental touring from the automobile engineer's viewpoint. It will be distributed among all motor car owners who make application therefor. Incidentally, it may be added that the current number of the Cole Bulletin contains an interesting illustrated story concerning the trip.

The Bosch Magneto Company, New York City, learns that the six-cylinder Sunbeam car, which recently created new world's records from 200 to 1000 miles and from two to 12 hours on the Brooklands track, Weybridge, England, was fitted with Bosch ignition.



# THE COOLING SYSTEM IN COLD WEATHER.

## Suggestions for Preparing Its Components for the Use of Anti-Freezing Solutions, Value of the Mixtures, and How They Are Maintained.

**W**ATER is defined as a colorless, tasteless fluid, which is practically incompressible, boils at 212 degrees Fahrenheit, and freezes at 32 degrees Fahrenheit. Its expansion in passing to a solid state is about 8.55 per cent. The last sentence is of vital interest to the motorist whose motor is of the water-cooled type and who has not made provision to guard against the resultant damage of freezing temperatures.

While the expansion above referred to may appear small, it may be termed irresistible insofar as the components of the cooling system are concerned and the solidifying of the contents of the cooler, water jackets and piping system, will burst these members as easily as if they were constructed of egg shells.

The experienced motorist usually prepares for

at a slight cost, and a burst radiator and cracked cylinders are very expensive, it is obvious that it is economy to be on the safe side.

Before discussing the various ingredients employed, suggestions for preparing the radiator, etc., will be of value, for the use of some forms of anti-freezing solutions requires that the cooling system be perfectly tight.

### Cleaning the Radiator.

After the car has been in service for several months, and especially where the water has not been changed, it is recommended that the old fluid be removed and the components thoroughly cleaned. While the water may not indicate the presence of scale, etc., in the radiator, the use of a cleansing preparation generally shows the presence of foreign elements. Chemical prepara-

## ANTI-FREEZING SOLUTIONS AND THEIR FREEZING POINT.

### Calcium Chloride.

|   | Degrees F. |
|---|------------|
| 1 pound salt—1 gallon water.....Freezing point  | 27         |
| 2 pounds salt—1 gallon water.....Freezing point | 18         |
| 3 pounds salt—1 gallon water.....Freezing point | 1.5        |
| 4 pounds salt—1 gallon water.....Freezing point | -17        |
| 5 pounds salt—1 gallon water.....Freezing point | -39        |

### Glycerine.

|  |     |
|--|-----|
| Water 95%—Glycerine 5%.....Freezing point  | 30  |
| Water 90%—Glycerine 10%.....Freezing point | 28  |
| Water 85%—Glycerine 15%.....Freezing point | 25  |
| Water 80%—Glycerine 20%.....Freezing point | 23  |
| Water 75%—Glycerine 25%.....Freezing point | 19  |
| Water 70%—Glycerine 30%.....Freezing point | 15  |
| Water 65%—Glycerine 35%.....Freezing point | 12  |
| Water 60%—Glycerine 40%.....Freezing point | 5   |
| Water 50%—Glycerine 50%.....Freezing point | 2   |
| Water 45%—Glycerine 55%.....Freezing point | -10 |

### Alcohol and Water.

|  | Degrees F. |
|--|------------|
| Water 95%—Alcohol 5%.....Freezing point  | 25         |
| Water 90%—Alcohol 10%.....Freezing point | 18         |
| Water 85%—Alcohol 15%.....Freezing point | 11         |
| Water 80%—Alcohol 20%.....Freezing point | 5          |
| Water 75%—Alcohol 25%.....Freezing point | 2          |
| Water 70%—Alcohol 30%.....Freezing point | -9         |
| Water 65%—Alcohol 35%.....Freezing point | -15        |
| Water 60%—Alcohol 40%.....Freezing point | -23        |

### Water, Alcohol and Glycerine.

|  |     |
|--|-----|
| Water 95%—Alcohol-Glycerine 5%...Freezing point  | 28  |
| Water 90%—Alcohol-Glycerine 10%...Freezing point | 25  |
| Water 85%—Alcohol-Glycerine 15%...Freezing point | 20  |
| Water 80%—Alcohol-Glycerine 20%...Freezing point | 15  |
| Water 75%—Alcohol-Glycerine 25%...Freezing point | 8   |
| Water 70%—Alcohol-Glycerine 30%...Freezing point | 5   |
| Water 67%—Alcohol-Glycerine 33%...Freezing point | -15 |
| Water 60%—Alcohol-Glycerine 40%...Freezing point | -23 |

cold weather and accompanying freezing temperatures by utilizing an anti-freezing solution, of which there are several, but the new automobilist, who purchased his machine in the spring, and who has forgotten the paragraph incorporated in the instruction book dealing with cold weather, needs reminding of the importance of observing the recommendations offered by the car manufacturer.

Freezing temperatures have been recorded in October and those who store their machines in unheated garages or make week-end trips to the country, will do well to either drain the water from the cooling system or utilize a solution having a freezing point well below 32 degrees Fahrenheit, depending upon locality, etc. As an effective solution may be prepared or purchased

tions may be purchased or a simple solution of common washing soda may be prepared. The latter mixture is made by dissolving as many crystals as the fluid will absorb, using five gallons of water, for example, if the cooling system employs this amount. If, on draining off the old contents the water is badly discolored, it is advisable to operate motor for some little time with soda solution. After its use the system should be thoroughly flushed out with water and the process repeated until the fluid is clear.

### Soldering the Radiator.

While the cost of anti-freezing solutions is not large, it is obvious that any existing leaks in the radiator, connections, etc., should be repaired to avoid the trouble of renewing the mixture. No hard and fast

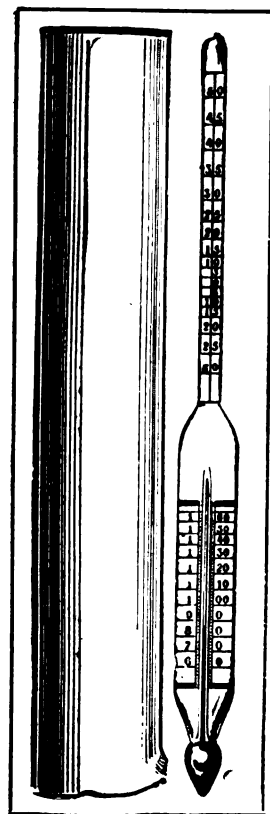


rule can be laid down for this work for the design and condition of radiators vary and will require different treatment. Sometimes a leak may be stopped easily by the application of a little solder. Then again, the character of the leak may be such that the services of an expert will be required. Unless one be familiar with soldering radiators the work is best left to the expert and in this respect the best is none too good. It is an easy matter to burn the metal.

There are several chemical preparations for repairing leaky radiators, these being poured into the water, and, blending with the fluid, find every opening in the circulating system. Upon coming

in contact with the air, the preparation hardens, forming a cement. These preparations may be employed without fear of damage to the radiator; in fact, the writer has utilized them with success in a cooler which resisted the efforts of an expert to stop the leaks.

Among the well known preparations of this nature is Se-ment-ol, manufactured by the Northwestern Chemical Company, Marietta, O. It comes in a small can, the contents of which are poured into the radiator and the motor operated for a short period, after which the fluid is drained off and replaced by the usual water or anti-freezing solution. The writer has obtained the best results with these mixtures by having the water slightly warm.



Pyro Freezometer.

The International Metal Polish Company, Indianapolis, Ind., markets a similar preparation termed Blue Ribbon radiator cement, which is guaranteed to repair any ordinary leak in a few minutes. The Radico Manufacturing Company, Springfield, Mass., also makes a compound called Radico.

#### Electrolytic Action.

Relative to anti-freezing solutions, some do not approve of their use, holding that they are detrimental to the metal parts of the cooling system. There is no doubt that alkaline solutions, which are electrolytes of high potential, produce

electrolytic action whenever two metals of dissimilar potential are employed together, as the brass tubing of the radiator and solder at the joints, the aluminum or brass flanges closing the core print holes of the cast iron cylinder, etc. But where the car is exposed for any great length of time or stored in an unheated building, some solution is essential.

#### Prepared Solutions.

Among the prepared anti-freezing solutions marketed is Thermite, made by the Northwestern Chemical Company. The company holds that its product is chemically correct, that it is harmless, and that a 50 per cent. solution will withstand temperatures of 15 below zero, and a clear, 70 degrees below. It is mixed with the water and affords protection according to the proportions utilized. A freezing chart and scale accompanies each can of the liquid.

Lubro, which is made by the Lubro Oil Company, Cleveland, O., is so-called by the maker because it is stated to possess lubricating qualities in addition to being an anti-freezing mixture. It is red, and is used in the proportions of one gallon to 2.5 of water and is said to withstand temperatures as low as 20 degrees below zero. Another solution is Zero 40, marketed by the Automobile Equipment Company, Detroit. It is a natural mineral water, the freezing point of which is stated to be 40 degrees below zero and with a boiling point of 222. These preparations described are easily handled and maintained.

#### Denatured Alcohol.

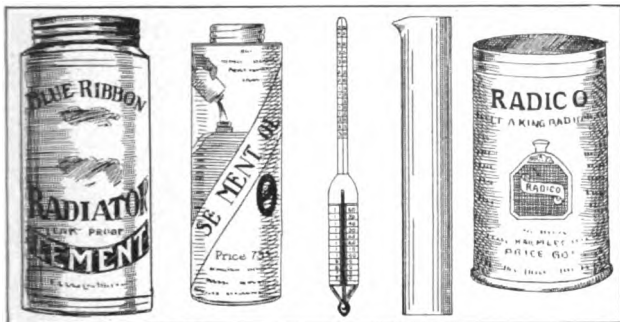
Pyro (denatured alcohol) is popular with a large number of motorists, as it is easily obtained and it is a simple matter to mix it with the water of the cooling system, the proportions depending upon locality, etc. Pyro is the trade name of the U. S. Industrial Alcohol Company, 27 William street, New York City, and is the ordinary ethyl alcohol of commerce made undrinkable by an admixture. When added to the contents of the cooler, in proportions of one part to three of water, the mixture will not congeal until the temperature has dropped below zero, and even then will not solidify, only the water in the solution forming flakes or crystals, making a snow like mass.

Given the capacity of the cooling system, it is an easy matter to ascertain the proper quantity of alcohol to employ and the freezing temperatures are given in an accompanying table. These differ slightly from the chart published by the maker of Pyro, but in the main are sufficiently correct.



### Use of Freezometers.

With alcohol solutions it is advisable to purchase and use a combined hydrometer and thermometer.



**Chemical Compounds for Leaky Radiators, Including Blue Ribbon Cement, Se-ment-ol and Radico—The Miller Freezometer Illustrated Is Employed to Test Solutions Containing Alcohol.**

mometer, two types of which are shown in accompanying illustrations. They are inexpensive and comprise the indicating device, also a jar for floating the hydrometer-thermometer in the fluid. If the indicated freezing point of the solution is higher than is desired, alcohol is added. If too high, water is employed. These instruments are invaluable in that they afford opportunity of testing the solution from time to time, eliminating guess work, which may be disastrous. The instruments illustrated are marketed by Chas. E. Miller, 97-103 Reade street, New York City, and the Taylor Instrument Company, Rochester, N. Y. They come with substantial cases and, as previously pointed out, are moderately priced.

### Calcium Chloride.

Among other ingredients employed as anti-freezing solutions are calcium chloride and glycerine. Sometimes the latter is combined with alcohol. Accompanying tables present formulae for mixing the different ingredients and the freezing points of each are also given. Calcium chloride is favored by some because of its low cost and in its pure state occurs in prismatic crystals soluble in one-quarter of its weight in water, and easily so in alcohol. The commercial form contains about 50 per cent. water of crystallization, and dissolves in half its weight in water. In preparing the mixture it is well to have several strips of blue litmus paper for testing. If it changes the color of this toward a red, the mixture is slightly acid and should be corrected by adding small quantities of milk of magnesia until the color of the paper remains unchanged.

### Glycerine and Alcohol.

A combination of glycerine and alcohol is favored by some because the former does not boil until it attains a temperature of 554 degrees

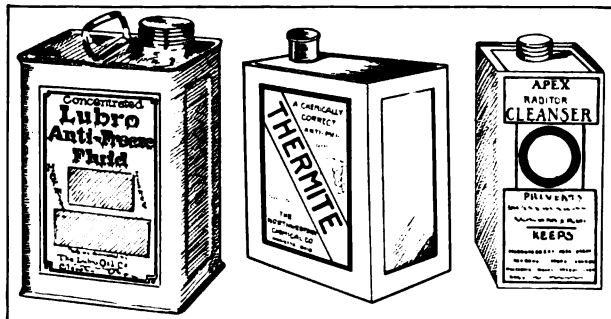
Fahrenheit, and even with the addition of alcohol, it is obvious that used with equal parts of water and alcohol its boiling point is well above that of some of the other ingredients. The solution, however, "creeps", the analogy being the creeping of the electrolyte on the terminals of a storage battery. This deposit does not dry up or evaporate, but rather increases after it has been in use a time. Consequently, the connections should be tight. Glycerine also attacks rubber, but as the cost of new piping is not prohibitive, new material can be fitted in the spring.

In the preparation of anti-freezing solutions whose boiling point is well below that of water, allowance should be made for the expansion of the fluids, especially on a mild day. If the cooler is filled to the top of the filler cap, more or less fluid will be lost by expansion. In localities where the temperature varies considerably, judgment will be necessary as to the use of the fan and radiator shield.

## MAINTAINING THE MOTOR CAR.

### Willys-Overland Company Issues Complete Instructions for New Model 70.

Continuing its policy of co-operating with the owner, the Willys-Overland Company, Toledo, O., maker of the Overland automobiles, has issued its annual book containing directions for the operation, care and adjustment of the new model 70, which was fully described recently. The book is considerably larger than its predecessor, which dealt with two models, and includes instructions as to the care of the electric lighting and motor starting system. Each component of the chassis is carefully explained and illustrated, and the directions for making adjustments are complete in each detail. The brochure appears



**Prepared Anti-Freezing Solutions, Including Lubro, a Colored Fluid; Thermite, and Apex, a Radiator Cleanser.**

in a durable dark green cover and the contents are indexed. One of the valuable features of the book is the lubrication chart.



## IMPORTERS' AUTOMOBILE SALON.

### Management Decides to Open Doors to Makers of American Machines.

The Importers' Automobile Alliance of New York City, under whose auspices the annual importers' salon in the Hotel Astor will be held Jan. 2-10, announces that several high grade American made cars will be included among the exhibits this year. Already five applications have been received, but it is understood that only those of the Fiat and Simplex have been granted as yet. The Fiat is made at Poughkeepsie, N. Y., which is the American factory, the home office being in Turin, Italy.

There have been rumors for two years past that the importers were to permit such display on the part of American manufacturers, but the nearest approach to such action was that of last year, when the Keeton was shown by its Canadian concern. Other exhibits always have been from the factories of France, Germany, England, Belgium, Italy or Austria.

## AMERICAN MOTORS' OFFICERS.

### J. I. Handley Is Re-Elected President and General Manager.

The work of the board of directors of the American Motors Company, Indianapolis, Ind., appears to have received the approval of the stockholders, judging from the result of the election at the annual meeting held early in the month. The following directors were elected for the ensuing year: J. I. Handley, V. A. Longaker, D. S. Menasco, Frank E. Smith and J. E. Kepperley.

Immediately after the close of the stockholders' meeting the directors met and chose the following officers: President and general manager, J. I. Handley; vice president, F. E. Smith; chairman and treasurer, V. A. Longaker; assistant treasurer, J. D. Bright; secretary, J. E. Kepperley.

## McFARLAN INTERESTS REORGANIZE.

### New Company Will Look After Production End of the Business Hereafter.

With the announcement of the organization of the McFarlan Motor Company in Connorsville,

Ind., comes the information that this concern is to take over the manufacture of McFarlan cars, heretofore conducted by the McFarlan Carriage Company. The cars have been distributed through a selling concern known as the McFarlan Motor Car Company, and no statement is made regarding a change in this plan.

The new company is incorporated for \$100,000, the incorporators being Alfred H. McFarlan, Edward W. Cotton and Burton M. Burrows. It is understood, however, that several other men are included among the stockholders. A petition in bankruptcy recently was filed against the McFarlan Carriage Company.

## NEW OAKLAND BODY DESIGN.

### Cabriolet Provides for Coupe in Winter and Roadster in Summer.

What it claims is a distinct innovation in the way of body equipment is the new cabriolet recently brought out by the Oakland Motor Car Company, Pontiac, Mich., maker of Oakland cars. The name implies a diminutive cab, but it really is more than that, as it provides for the enclosed features of the coupe in winter and an open roadster type in summer.

A somewhat ingenious method of construction makes it possible to tilt the top backward into small compass at the rear. The side windows are hinged and fold down and inward against the doors, while the side panels drop into the walls of the car. The top and windows are operated from within and the driver has complete control without leaving the car.

The company is also producing a sedan model, the particular feature of which is the provision for one spacious compartment with ample seating space for four persons. The driver's seat slides back and forth to accommodate the stature of the occupant. All seats are arranged so that entrance may be had from either side.

Dr. Lee C. Deming, who recently drove across the continent from his home in Pasadena, Cal., to New York City, is not satisfied with this record and is to undertake the return trip. Accompanied by his wife and daughter, Dr. Deming proposes to drive his Overland car on a tour of practically all of the eastern and southern parts of the United States, winding up with another transcontinental trip, and he left New York recently for this purpose.



**VULCAN CLIMBS HOG BACK.****New Car Accomplishes Task Which Has Proved Too Much for Others.**

The testing department of the Vulcan Manufacturing Company, Painesville, O., maker of the new Vulcan car, has found a course which it believes will give the machines the necessary trial in hill climbing ability and braking efficiency. Just outside the city is a hill known locally as Hog Back, with what is said to be a 66 per cent. grade, and it long has held an interesting position among the supposedly impossible tasks set for car owners. The Vulcan not only climbed the grade with seeming ease, but completed seven round trips without difficulty.

The worst feature about the hill is the sharp hairpin turn near the foot, which prevents any attempt at getting a flying start, and necessitates a speed not exceeding seven miles an hour on the downward trip. The Vulcan tester is said to have utilized but one set of brakes at a time, in an effort to demonstrate conclusively that the design and construction of the braking system were adequate to meet every emergency.

**BUILDING NEW CLUB HOUSE.****Home of Massachusetts Automobile Club Will Provide Storage for 400 Cars.**

By the first of the new year it is expected that the new seven-story club house of the Massachusetts Automobile Club, that is now being erected at the corner of Clarendon and Stuart streets, Boston, Mass., will be ready for occupancy. The building will be modern in every particular and afford the members every convenience.

In the garage department arrangements have been made for the storage of 400 automobiles in single rank. The building also will include the executive offices of the club, lounging and smoking rooms, committee rooms and service and repairing station.

**LOS ANGELES-PHOENIX RACE.****Expected That 25 to 30 Cars Will Be Lined up at the Start.**

During the early morning hours of Nov. 3 the first car will be started and the 1913 Los Angeles-Phoenix road race will be under way. At last report 12 entries had been received and from

present indications it is expected that there will be between 20 and 25 starters.

For the first 25 miles out of Los Angeles the cars will run along boulevards, and then the country roads, good and bad in places, will be encountered, but it is believed by drivers who have been over the course that between Los Angeles and San Diego an average speed of 50 miles an hour will be made. From San Diego to the desert edge there are several mountain roads with a number of abrupt curves that will probably materially decrease the average speed for the whole distance to be covered.

**IMPORTS AND EXPORTS.****Former Shows a Decrease of 50 Per Cent. and Latter a Gain of 45.**

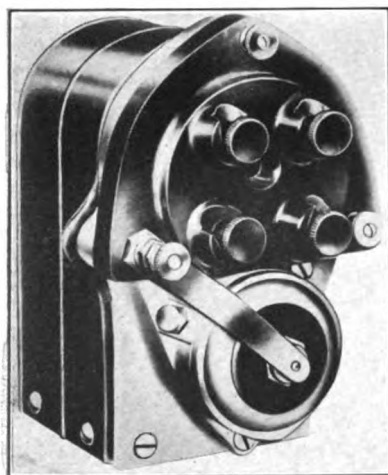
The report of the bureau of foreign and domestic commerce, Department of Commerce, Washington, D. C., for the month of August, shows that 31 automobiles, valued at \$61,199, were imported into this country, as compared with 66 automobiles, valued at \$155,277, during the same month in 1912. The export figures show, that 1936 pleasure cars, valued at \$1,874,312, and 68 commercial vehicles, valued at \$109,437, or a total of 2004 cars, with a valuation of \$1,983,749, were shipped abroad during August, 1913, as against 1264 pleasure cars, valued at \$1,288,354, and 57 commercial vehicles, valued at \$107,245, totalling 1321 cars, valued at \$1,395,599, shipped abroad during August, 1912. The imports this year have fallen off over 50 per cent., while the exports show an increase of a little better than 45 per cent. The tabulation, according to countries, follows:

|                                  |             | <b>Imports.</b>    |             |                    |  |
|----------------------------------|-------------|--------------------|-------------|--------------------|--|
|                                  |             | 1912               |             | 1913               |  |
| Country                          | No.         | Value              | No.         | Value              |  |
| France .....                     | 33          | \$82,639           | 10          | \$22,208           |  |
| Germany .....                    | 3           | 5,705              | 3           | 3,213              |  |
| Italy .....                      | 5           | 10,899             | 4           | 8,123              |  |
| United Kingdom ...               | 13          | 31,684             | 4           | 9,144              |  |
| Other countries.....             | 12          | 24,300             | 10          | 18,511             |  |
| <b>Totals.....</b>               | <b>66</b>   | <b>\$155,227</b>   | <b>31</b>   | <b>\$61,199</b>    |  |
|                                  |             | <b>Exports.</b>    |             |                    |  |
| Country                          | No.         | Value              | No.         | Value              |  |
| France .....                     | 51          | \$35,892           | 40          | \$39,453           |  |
| Germany .....                    | 58          | 45,021             | 70          | 55,577             |  |
| Italy .....                      | 32          | 21,880             | 30          | 19,153             |  |
| United Kingdom....               | 113         | 100,090            | 461         | 374,098            |  |
| Other Europe .....               | 141         | 111,592            | 91          | 63,308             |  |
| Canada .....                     | 320         | 486,285            | 274         | 416,181            |  |
| Mexico .....                     | 25          | 35,289             | 18          | 32,923             |  |
| West Indies and<br>Bermuda ..... | 19          | 22,645             | 36          | 34,325             |  |
| South America .....              | 174         | 172,916            | 231         | 285,835            |  |
| British Oceania ...              | 226         | 212,544            | 284         | 228,389            |  |
| Asia and other<br>Oceania .....  | 112         | 108,897            | 186         | 192,748            |  |
| Other countries.....             | 50          | 42,548             | 283         | 236,759            |  |
| <b>Total.....</b>                | <b>1321</b> | <b>\$1,395,599</b> | <b>2004</b> | <b>\$1,983,749</b> |  |



## SPLITDORF MAGNETO EQUIPMENT FOR FORD.

**A**LTHOUGH it was known that the Splitdorf Electrical Company, Newark, N. J., maker of the well known Splitdorf magnetos, was producing a true



**Fig. 1—Splitdorf True High-Tension Fixed Spark Magneto.**

high-tension magneto and a special equipment for model T Ford motors, definite details were not announced until recently for, in keeping with the policy of the concern, the system was given severe laboratory and road tests before being offered to the public.

One of the several features of the Splitdorf equipment is the simplicity of installation, it requiring no other knowledge of mechanics than the replacing of the old timing gear plate with the Splitdorf design, meshing and locking the gears, and timing the magneto, a simple operation. The new plate is machined accurately and integral with it is the base or plate supporting the instrument, the proper position of which is assured by means of dowel pins. The magneto is retained by the conventional strap arrangement. Complete instructions accompany each equipment, and it is stated by the maker that it may be installed in less than three hours by the novice.

Drive is by enclosed gears operating in lubricant, standardized practise, assuring accurate timing and noiseless operation. Crankshaft speed, necessary with four-cycle, four-cylinder motors, is obtained by utilizing an idler gear, this member meshing with a gear on the camshaft and making two revolutions to one of the last named gear.

The magneto is shown at Fig. 1 and is water and dust proof, very compact and has sufficient reserve energy for a considerably larger motor than the Ford. The base is of aluminum, to which the pole pieces are secured, and between which rotates the double wound armature, the shaft of which is mounted on two annular bearings. The operating parts are protected from foreign elements by a ribbed aluminum cover.

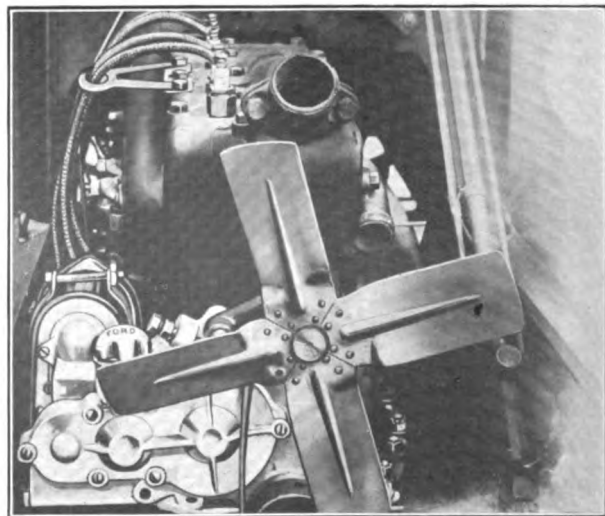
The circuit breaker is attached to one end of the armature shaft and revolves with it.

The break of the primary circuit is obtained by a fibre roller supported by one end of the breaker arm, the roller coming in contact with a steel cam at the predetermined instant and when the greatest number of lines of forces are cut. It is pointed out that, owing to centrifugal action, the platinum points come in contact in a positive manner at high speeds, permitting of the use of a weaker spring than usual, thus lessening wear on the cam. The fibre roller is adjustable for service. The high-tension winding of the armature is connected to a collector ring suitably mounted, and from this member the current passes through a carbon brush, etc., thence to the distributor disc. Distribution to the proper spark plugs is by cable in the conventional manner.

As will be noted, the magneto is of the fixed spark type, it being pointed out by the maker that the construction makes for maximum motor efficiency at all speeds in that the operator cannot improperly vary the time of break of the primary circuit, and that the design relieves the driver from changing the position of the usual spark lever from time to time. The timing of the magneto is such that a hot spark is obtained at a quarter-turn of the starting crank.

As is obvious, the installation of the equipment eliminates the usual timer, timer rod, primary wires, coil, etc., and as the spark lever is not required it might be put to a useful purpose, for operating some form of gas saving device manually controlled, for example.

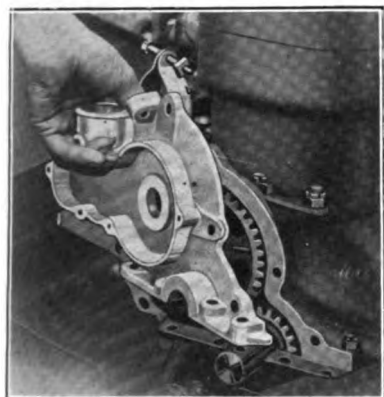
The method of installing the Splitdorf equip-



**Fig. 2—Illustrating the Splitdorf Magneto Equipment Installed on Model T Ford Motor.**



ment is as follows: The radiator is drained and removed, but before displacing the fan and its connections it is important that the pin retain-



**Fig. 3—New Timing Gear Plate Housing Gears and Manner of Fitting.**

The cotter pins holding the fan pulley in place can be removed with a pair of pliers, and the pin can be driven out with an ordinary punch through the hole in the engine base previously alluded to. A smart blow on the pulley should free it from the crankshaft. All commutator and secondary wires are disconnected and removed.

The timing gear plate is displaced by removing eight screws, but the felt packing of the crankshaft bearing and camshaft timing gear stud housing is fitted to the new plate. The last named member is fitted easily if held at a slight angle, as shown at Fig. 3, and it is recommended that a new gasket, shellacked on both sides, be utilized between the new plate and the crankcase. All screws are replaced with the exception of the fan member.

The large, 36-tooth gear is next placed on the timer shaft with a liner washer between it and the pinion, and the assembly locked by a cotter pin through the slot in the hub of the gear and hole in the shaft, after which the original nut is replaced and set up tight. The magneto is next placed on its base and strapped in position. The magneto gear is held by a Woodruff key and locked by a nut. The fan pulley, belt, starting crank clutch, etc., are next assembled and the magneto is ready for timing.

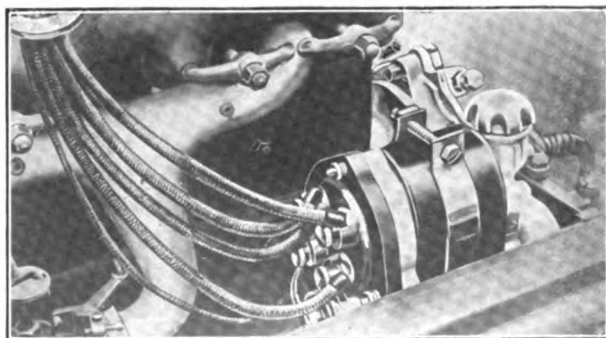
The crankshaft is rotated until the piston of the cylinder nearest the radiator is within .3125 inch of the completion of the compression stroke, or top dead centre. By removing the cover of the cam holder of the magneto, retained by a spring, which is swung back, and using a small mirror in the operation, the proper position of the armature shaft may be located. The armature

shaft is rotated as shown until the brass distributor segment in the peep hole in the distributor block points to the upper left hand connection on the block member. The shaft is further rotated—only slightly—until the contact roller just touches the cam. The idler or intermediate gear is then placed in position or meshed. It may be changed a tooth earlier or later if necessary, but the timing described is recommended.

The wiring is simple. The Ford motor fires 1, 2, 4, 3, and as the distributor rotates anti-clockwise, looking at the circuit breaker end, the upper right hand terminal is connected by cable to the spark plug of the first cylinder, the second to the second, the terminal marked 4 to the fourth cylinder, or the third to fire, and the No. 3 terminal to the third cylinder, which is the last to fire.

The high-tension cables are supported by a special clip which is bolted to the cylinder head, as shown at Fig. 2, preventing breaking down of the insulation by exposure to the heat of the exhaust manifold. A wire is carried from the grounding stud of the magneto to the dash switch, which is included in the equipment, and another lead from the switch is secured to the metal bolt retaining the steering column bracket. Closing the switch diverts the primary current generated by the magneto from the secondary windings to ground, consequently, with the switch open, the motor will operate.

The advantages of a high-tension magneto over the usual system of ignition on Ford motors has been discussed at length in these columns. It was pointed out that it makes for greater power, economy of fuel, cooler motor, etc., and synchronization of the spark. The Splitdorf special Ford equipment may be ob-



**Fig. 4—Side View of Installation, Showing Compactness of Magneto, Method of Retention and Simplicity of Wiring.**

tained at any of the branches of the company, which are listed in the Classified Buyers' Guide, found elsewhere in this issue.



## MORE SHOW EXHIBITORS.

### Supplementary List of Concerns Which Will Display in New York.

Elsewhere in this issue is presented the list of car manufacturers who were allotted space at the New York and Chicago shows at the initial drawing, and the allotments made by the Motor & Accessory Manufacturers. Since these were made public additional concerns have secured space for the New York show, in Grand Central Palace, Jan. 3-10, as follows:

Allen Motor Co., Fostoria, O., Allen cars.  
 Asch & Co., New York City, wrenches.  
 Ajax Trunk & Sample Case Co., New York City, trunks, etc.  
 Asbestos & Rubber Wks. of Am., New York City, brake lining.  
 American Taximeter Co., New York City, recorders.  
 Automobile Journal Pub. Co., Pawtucket, R. I.  
 Brown Co., Syracuse, N. Y., pumps.  
 B. & L. Auto Lamp Co., New York City, lamps.  
 Bock Bearing Co., Toledo, O., bearings.  
 Bausch Machine Tool Co., Springfield, Mass.  
 Peteller Shock Absorber Corp., New York City, shock absorbers.  
 Northway Motor & Mfg. Co., Detroit, motors.  
 Miller Rubber Co., Akron, O., tires.  
 Crescent Motor Co., Cincinnati, O.  
 Champion Spark Plug Co., Toledo, O., spark plugs.  
 A. R. Justice Co., Philadelphia, plating material.  
 Cleveland Hardware Co., Cleveland, O., bow shifters.  
 Rushmore Dynamo Works, Plainfield, N. J., lamps.  
 Rich Tool Co., Chicago, Ill., tools, etc.  
 J. R. Ashley Co., New York City, portable garages.  
 Wm. R. Laidlaw, Jr., New York City, top materials.  
 C. A. Willey Co., New York City, paints.  
 Model Gas Engine Works, Peru, Ind., motors.  
 P. Reilley & Son, Newark, N. J., top materials.  
 Chas. E. Miller, New York City, general accessories.  
 Frazier Lubricator Co., Chicago, Ill., lubricators.  
 Peter A. Frasse & Co., New York City, chains.  
 Jones Electric Starter Co., Chicago, Ill., starters.  
 Universal Lubricating Co., Cleveland, O.  
 Fentress-Newton Mfg. Co., Detroit.  
 Howe Rubber Co., New Brunswick, N. J., inner tubes.  
 International Metal Polish Co., Indianapolis, Ind., polishes, etc.  
 Fitzgerald Mfg. Co., Torrington, Conn., horns.  
 Perkins Campbell Co., New York City, license brackets, etc.  
 Columb Tyres Import Co., New York City, tires.  
 J. Eavenson & Son, Inc., Camden, N. J., soaps.  
 Havoline Oil Co., New York City, lubricants.  
 Johns-Manville Co., New York City, general accessories.  
 Chauffeur Pub. Co., New York City.  
 Donnelly Motor Equip. Co., New York City.  
 David Kahnweiler's Sons, New York City, fire extinguishers.  
 Cox Brass Mfg. Co., Albany, N. Y., sundries.  
 Eveland Eng. & Mfg. Co., Philadelphia.  
 Motor Patents Co., Detroit.  
 Pyrene Mfg. Co., New York City, fire extinguishers.  
 Emil Grossman Co., Brooklyn, N. Y., spark plugs.  
 Rhineland Machine Works Co., New York City, bearings, etc.  
 New York Coll. Co., New York City, ignition.  
 J. Alexander Mfg. Co., New York City, bodies.  
 John T. Stanley, New York City, soaps, etc.  
 Thermoid Rubber Co., Trenton, N. J., brake linings.  
 Motor, New York City.  
 Metal Stamping Co., Long Island City, N. Y., stampings.  
 Wayne Oil Tank & Pump Co., Fort Wayne, Ind., storage systems.  
 S. P. Townsend & Co., Orange, N. J., grease guns.  
 Aristos Co., New York City, shock absorbers, etc.  
 L. Sonneborn Sons, New York City, lubricants.  
 Chas. O. Tingley & Co., Rahway, N. J., tire accessories.

Baum's Castorine Co., Rome, N. Y., soaps and polishes.  
 United & Globe Rubber Mfg. Co., Trenton, N. J., tires.  
 Platt & Washburn Refining Co., New York City.  
 H. P. B. Electric Co., Rye, N. Y.  
 Newmastic Co., New York City, rims.  
 Thurber Rotary Starter Co., Detroit, starters.  
 English & Mersick Co., New Haven, Conn., specialties.  
 Motor Vehicle Pub. Co., New York City.  
 R. I. V. Co., New York City, ball bearings.  
 Motor World Pub. Co., New York City.  
 Nonpareil Horn Mfg. Co., New York City, horns.  
 Marburg Bros., New York City, magnetos, etc.  
 Horseless Age Co., New York City.  
 H. H. Franklin Mfg. Co., Syracuse, N. Y., parts.  
 Motorcycle Pub. Co., New York City.  
 Berg Auto Trunk & Spec. Co., New York City, trunks.  
 N. B. Arnold, Brooklyn, N. Y., polishes.  
 National Rubber Co., St. Louis, Mo., tire accessories.  
 Majestic Mfg. Co., Worcester, Mass., sidecars.  
 Julian H. Faw, New York City, blow-out patches, etc.  
 Motorcycling, Chicago.  
 Eclipse Machine Co., Elmira, N. Y., clutches, brakes, etc.  
 Bicycling World, New York City.  
 Standard Woven Fabric Co., Framingham, Mass., brake linings.  
 W. H. Brown, Cleveland, O., recorders.  
 Houpert Machine Co., New York City, motor parts, etc.  
 Silvers Co., 60 Wall St., New York City, polishes.  
 Detroit Steel Products Co., Detroit.  
 Hawthorne Mfg. Co., Bridgeport, Conn., pumps, lamps, etc.  
 Ernst Flentje, Cambridge, Mass., shock absorbers.  
 Essex Rubber Co., Trenton, N. J., bumpers.  
 Golde Patent Mfg. Co., New York City, tops.  
 Chilton Co., Philadelphia.  
 Perfection Spring Co., Cleveland, O., springs.  
 Class Journal Pub. Co., New York City.  
 Thomas Proesser & Son, New York City, axles.  
 K-W Ignition Co., Cleveland, O., ignition.  
 L. J. Muttly Co., Boston, Mass., top materials.  
 Ralph Walcott, New York City.  
 McQuay-Norris Mfg. Co., St. Louis, Mo., piston rings.  
 United States Gauge Co., New York City, tire gauges.  
 Mayo Mfg. Co., Chicago, radiators.  
 Stevens & Co., Chicago, tire accessories.  
 F. A. Baker & Co., New York City, motorcycle sundries.

## TRAINS SUCCESSFUL CHAUFFEURS.

### Many Graduate from Smith Bros.' Automobile School in Hartford, Conn.

Attention is drawn to Smith Bros.' Automobile School in Hartford, Conn., by reason of the fact that a class of 14 young men has just been graduated. These students are not only qualified as chauffeurs, but are expert repair men as well, the course of instruction embracing every phase of automobile service.

During the past six months this school has sent out 315 young men who have received chauffeur's licenses. Some of them came from Boston and Worcester, and only a few are unemployed at present. The instruction is individual. There are evening classes for those who are employed during the day.

J. M. Studebaker, head of the extensive Studebaker Corporation, recently celebrated his 80th birthday by doing a big day's work at his desk in South Bend, Ind., supervising the properties there and in Detroit. The anniversary was fittingly observed throughout the organization.



# THE NEW MARION SIX HAS MANY REFINEMENTS.

**T**HE J. I. Handley Company, Indianapolis, Ind., sole distributor of the Marion line, manufactured by the Marion Motor Car Company of the same city, announces a six-cylinder chassis for the season of 1914, to which will be fitted four types of bodies, these including a five-passenger touring car, a two-passenger roadster, a four-passenger coupe and a five-passenger sedan. The new car presents several changes in mechanical design from former models, a dry disc clutch replacing the cone type, and the driver being placed at the left with centre control.

The usual breather pipes have been eliminated, the crankcase compression escaping through openings directly into the valve mechanism pockets in the cylinder castings, carrying with it an oil mist that lubricates this mechanism thoroughly. Breather holes in the valve cover plates relieve the pressure in these pockets, so that in reality this arrangement simply means the utilization of the oil that formerly was wasted by being carried off through the exit direct from the crankcase to the open air.

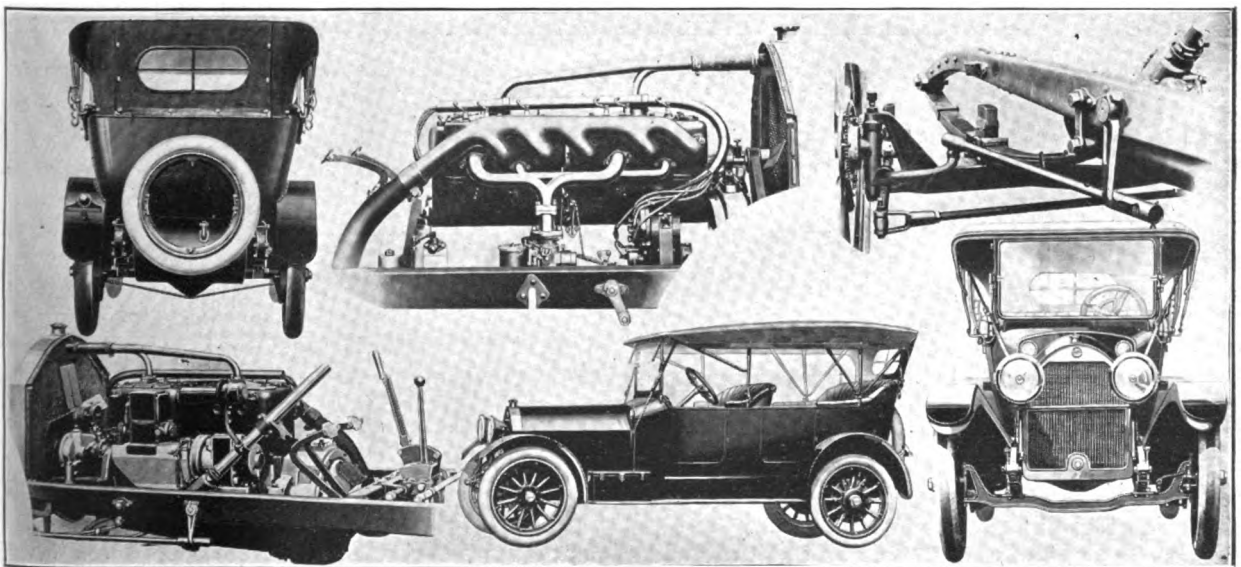
Among the refinements is the use of an accessible and easily adjusted coupling in the shaft between the magneto armature and the driving member. It comprises two flanges with bolt holes drilled at different intervals in the circumference, permitting of changing the timing two degrees or more without altering the position of the actuating gears.

The motor is of the L head type with the cylinders cast in threes and these have a bore of 3.75 inches and stroke of 5.25. It is rated at 50 horsepower, but it is stated that it has developed 54 on the block at 2000 revolutions a minute. The valves are large, fully enclosed, and the timing gears are spiral, but the shaft driving the pump first and then the dynamo is actuated from the crankshaft through a silent chain. The pump is of the centrifugal type, the radiator a honeycomb, and the pressed steel fan is adjustable.

One of the features of the motor is the arrangement of the manifolds. In each cylinder casting the intake ports are siamesed so that the mixture is led into the block between the last two cylinders of each casting, permitting of the use of

## DETAILS OF 1914 MARION LINE.

**Adjustable Magneto Coupling.**  
**Elimination of Breather Pipes.**  
**Turnbuckle Adjustment of Brakes.**  
**Electric Lighting and Motor Starting.**  
**Electric Horn Mounted on Steering Column.**  
**Cone Clutch Displaced by Dry Disc, 19 Plates.**  
**Self-Lubricating Shackle Bolts, Instead of Grease Cups.**  
**Left Hand Drive and Centre Control, Instead of Right.**  
**Spare Tire Carried on Auxiliary Felloe at Rear of Chassis.**  
**New Six-Cylinder Chassis, Cylinders Cast in Threes; Bore, 3¾; Stroke, 5¼; Horsepower, 33.75, S. A. E. Rating.**  
**Body Styles—Five-Passenger Touring Car, Two-Passenger Roadster, Four-Passenger Coupe and Five-Passenger Sedan.**



Illustrating Some of the Features of the New Marion Six, Involving Several Mechanical Changes from Current Marion Practice.



a simple Y shaped manifold. Individual exhaust passages are utilized, the gases passing out in a straight line to the exhaust pipe, which is a flexible metal tubing.

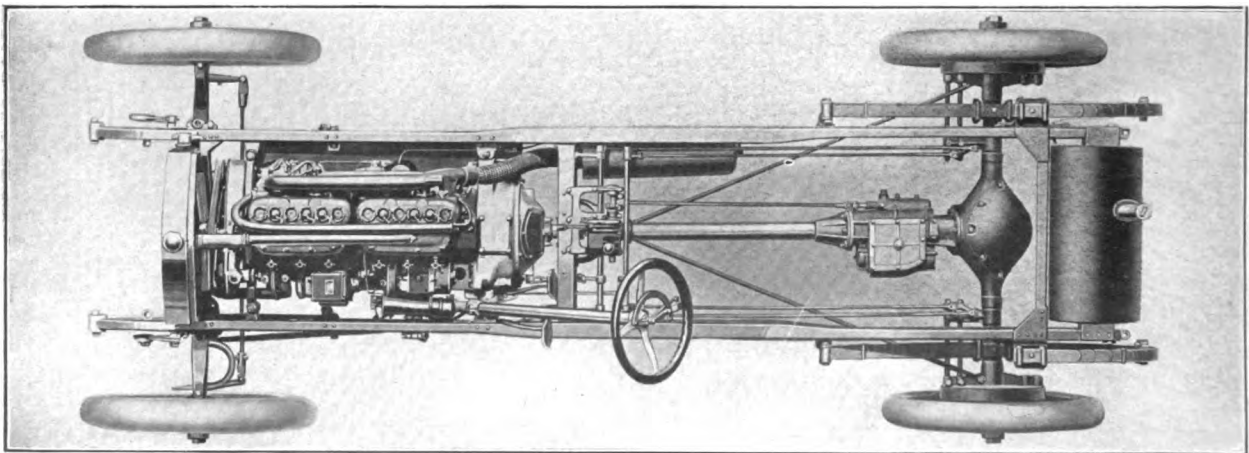
Ignition is by a Splitdorf magneto, carburetion by a Rayfield, while the fuel feed is by pressure maintained by a pump actuated from the camshaft. The fuel tank is suspended at the rear, is provided with a convenient gauge, and has a capacity of 20 gallons. The lubricating system is a combination force feed to the main bearings and automatic level splash. The cone clutch has been abandoned for the dry disc, comprising 10 driving and nine driven plates, and easy engagement is emphasized in the construction. The motor and clutch form a unit which is suspended at three points. Ample provision is made for the adjustment of the clutch and components of the power plant.

The Marion type of rear system is continued

eliminated on the spring shackles, the bolts of which are made hollow and carry wicking saturated with oil.

The wheelbase is 124 inches and the tires are 35 by 4.5-inch with quick detachable, quick demountable rims as standard equipment. One of the features of the new chassis is the method of carrying the spare shoe. Instead of the usual basket or strap, an auxiliary felloe is mounted at the rear of the frame and the extra tire is mounted on this and firmly bolted in place exactly the same as on the wheel, except that one lug is used. This arrangement not only makes for security, but quick service. Another refinement is the use of bumpers placed on the underside of the frame instead of the conventional practise of mounting them on the rear axle.

The operator is placed at the left with centre control, and the lighting and ignition switches, ammeter, gauges and other control members are



**Chassis View of Marion Six, Having a Dry Disc Clutch, Left Hand Control and a Motor Rated at 54 Horsepower.**

with the gearset rigidly bolted to the differential housing. The transmission provides three forward speeds and a reverse, the gear ratio of the rear axle giving a 3.75:1 on the direct drive. The gears and shafts are 3.5 per cent. nickel steel and special Hyatt bearings are utilized.

The axle is of the floating type and instead of the usual dog fitting into the hub of the rear wheels the live shafts have a deep flange which bolts onto the wheel itself, eliminating opportunity for lost motion in transmitting the power. Hyatt roller bearings are utilized throughout.

The frame is suspended on special imported Sheffield steel springs, semi-elliptic in front and three-quarter elliptic in the rear. Both sets of brakes are of the internal type and a turnbuckle on the rear end of the brake rods provides quick and easy adjustment. Grease cups have been

located on an instrument board just far enough under the cowl to protect them from the weather. The motor starter is actuated by depressing a pedal and energy is applied through silent chain directly to the motor crankshaft. The lighting and motor starting system is a Westinghouse. The electric headlights are mounted upon straight vertical rods, which carry them higher than in usual practise and the side lights are inset in the dash. A novelty is noted in the mounting of the electric horn, it being placed on a special bracket attached to the steering column. It is also under the hood.

The body lines tend toward straighter design than formerly, except for the slight bell shape at the rear, and roominess is noted in all models. Deep Turkish upholstery of high grade material is used, and the equipment is complete.



## BIG PLANT FOR MINNEAPOLIS.

**Standard Motor Company Organized with Capital of \$6,000,000.**

Announcement is made from Minneapolis that the Standard Motor Company has been organized in that city with capital of \$6,000,000, and that plans are under way for the erection of a \$3,000,000 automobile manufacturing plant. The statement includes the information that the new concern will take over the Minneapolis Motor Company and the Colby Motor Company, the latter of Mason City, Ia.

Among those said to be interested in the project are: F. E. Kenaston, president of the Minneapolis Threshing Machine Company; M. J. Scanlon of the Brooks-Scanlon Lumber Company and the Scanlon-Gipson Lumber Company, and P. M. Starnes, vice president of the American Timber Holding Company.

## TO DOUBLE ITS OUTPUT.

**C. A. Shaler Company Begins Work on Three-Story Addition to Its Factory.**

The C. A. Shaler Company, Waupun, Wis., maker of Shaler vulcanizing devices, has broken ground for the erection of a three-story addition to its present plant. It is anticipated that this will give ample floor space and other facilities for practically doubling the output of the company.

The old plant was built in 1911 and has become entirely inadequate to supply the demand for the product, although it has been operated 23 hours a day nearly all summer. The new structure will be devoted to the manufacture of the garage steam vulcanizer, which was placed in the market about a year ago.

## BUYS AUTOMOBILE SCHOOL.

**West Side Y. M. C. A. Will Absorb New York School of Automobile Engineers.**

The West Side Y. M. C. A., Eighth avenue and 57th street, New York City, has long been successful in operating an automobile school from which its graduates have found ready employment because of the thoroughness of the course adopted. It is not without some surprise, however, that it is learned that this association has acquired the New York School of Automobile Engineers, 146 West 56th street, and that the

entire equipment has been transferred to the Y. M. C. A. plant, where the students who began courses under the old management are to finish their studies.

As a result of the absorption an arrangement has been made with the International Motor Company, whereby the Y. M. C. A. school will train men for that concern. In addition, it is announced that the International company has placed a three-ton Mack truck at the disposal of the Y. M. C. A. school to be used in giving road lessons in the motor truck department. The new equipment acquired by the school includes the following: Saurer and Mack chassis, complete motors, clutches, carburetors and transmissions, and a Mack axle.

## CLAIMS PATENT INFRINGEMENT.

**Bosch Magneto Company Alleges Manufacturers Are Ignoring Its Rights.**

The Bosch Magneto Company, New York City, says that with the increased activity in the motorcycle and cyclecar branches of the industry, it has been brought to its attention that certain manufacturers of magnetos are constructing instruments which are held to be direct infringements of Bosch patents. Patent No. 974,967, issued to G. Honold, Nov. 8, 1910, which is claimed to be the basis for successful magneto ignition for gas engines of the two-cylinder V type, covers the invention in question. Special attention is directed to two of the claims, as follows:

The combination of a dynamo electric generator having means for producing a plurality of substantially equal maximum rates of change of flux at alternating longer and shorter intervals, of ignition circuits arranged to be energized by said changes of flux, and two explosive engines having igniters within the ignition circuits and arranged in intersecting planes.

The combination with two explosive engines having the axes of their cylinders inclined to each other, said engines being provided with igniters, of an electric generator having its armature driven by and at a fixed speed with relation to the engine, and having generator windings, means for producing an intermittent maximum rate of change of flux through the generator coils at alternately longer and shorter angular intervals corresponding to the angular intervals between the times of ignition and ignition circuits, including the generator windings and the respective ignition devices of the engine, whereby a maximum voltage is produced at the igniter of each engine at the time of ignition.

The Motometer Company, New York City, learns, with pleasure, that Jules Goux and Georges Boillot utilized motometers made by this company, on the radiators of their winning Peugeot cars in the recent small car race in France. It is stated that this is the first strictly American device that has ever been used by foreign racing drivers.



### SEVENTEEN YEARS AFTER.

#### Pioneer Boston Dealers Celebrate Beginning of Automobile Industry.

While there was much previous experimentation with the horseless carriage, some of it taking place in Boston and some elsewhere in the country, it hardly will be denied that the automobile industry in America really saw its beginning in that city. Seventeen years ago the first agency for cars was established in the Hub. This fact was fittingly celebrated by some of the pioneer automobile men in the Copley Square Hotel the evening of Oct. 23.

The story has often been told, but it will bear repeating again—briefly. It was 17 years ago this month when Kenneth Skinner of Boston arrived in New York from France, bringing with him a De Dion-Bouton tricycle propelled by a gasoline motor. That is, it was generally hoped that it could be propelled by its gasoline motor. The customs authorities were at a loss as to the proper classification under which to admit the vehicle, and Mr. Skinner was permitted to place his own valuation upon it. He suggested \$100, and the clerk assessed \$45 as duty. Immediately afterward he confided to a fellow clerk that he felt sorry for the importer as it would be necessary to push the contrivance all the way to the Boston train.

The other evening Mr. Skinner recounted the circumstances attending the importation of this first self-propelled road vehicle, and several of those present were able to supply some interesting sidelights. It must be remembered that success did not at all times perch upon the banner of those who sought to build other machines after this model, or to dispose of them after they were made.

At the conclusion of the dinner it was decided to form a permanent organization of the veterans of the industry, and R. R. Ross, Harry Fosdick and George G. Reed were appointed a committee to arrange the details.

### ELEVEN NEW MEMBERS.

#### Motor & Accessory Manufacturers Announces Several Additions to Its Ranks.

Announcement has been made by the Motor & Accessory Manufacturers, New York City, of the election of new members as follows: Cleveland Tanning Company, manufacturer of leather, Cleveland, O.; Racine Manufacturing Company,

automobile bodies, Racine, Wis.; Benford Manufacturing Company, spark plugs, timers, oil gauges, lighters, screw machine work, etc., Mt. Vernon, N. Y.; Gemmer-Detroit Starter Company, air pumps, garage plumbing outfits and air starters, Detroit; McGraw Tire & Rubber Company, tires and inner tubes, East Palestine, O.; J. M. Shock Absorber Company, J. M. shock absorbers, Philadelphia, Penn.; F. S. Carr Company, rubberized top and seat covering material, Boston, Mass.; Torbensen Gear & Axle Company, axles, Newark, N. J.; Taylor Instrument Company, thermometers, barometers, hydrometers, etc., Rochester, N. Y.; Reynolds-Browne Company, automobile lamps, Chicago, Ill.; Knight Tire & Rubber Company, tires and inner tubes, Canton, O.

### AT THE ELECTRIC SHOW.

#### Two New Commercial Vehicles and a Touring Car Model Are Revealed.

The Electrical Exposition and Motor Show, which opened in the Grand Central Palace, New York City, Oct. 15, served to introduce to the industry two new light delivery wagons and a touring car. Seven makes of automobiles were displayed, the new vehicles being a 1000-pound G. V., a Champion of the same capacity and a Bailey touring car.

The Champion is made by the Henry Tobin Company, New York City, and it is understood that it also will be presented with carrying capacity of 750 pounds. The touring car resembles the well known roadster produced by the Bailey concern, and except for the fact that it is slightly smaller and lower than a gasoline machine, might easily be mistaken for one. The new G. V. presents a number of changes from former practise with the General Vehicle Company.

The list of exhibitors representing the automobile and allied industries follows:

Albert & J. M. Anderson Manufacturing Company, Boston, Mass.; S. R. Bailey & Co., Amesbury, Mass.; Edison Storage Battery Company, Orange, N. J.; Electric Storage Battery Company, Philadelphia; Elizabeth Automobile Company, Elizabeth, N. J. (Standard cars); General Electric Company, Schenectady, N. Y.; General Motors Truck Company, Pontiac, Mich.; General Vehicle Company, Long Island City, N. Y.; Gould Storage Battery Company, New York City; H. W. Johns-Manville Company, New York City; Manhattan Electrical Supply Company, New York City; Philadelphia Storage Battery Company, Philadelphia; Rhineland Machine Works, New York City; Clarence L. Smith Company, New York City; Wagner Electric Manufacturing Company, St. Louis, Mo.; Henry Tobin Company, New York City; Ward Motor Vehicle Company, New York City; Westinghouse Electric & Manufacturing Company, Pittsburg, Penn.; Couple-Gear Freight-Wheel Company, Lansing, Mich.



## GENERAL NEWS OF THE INDUSTRY.

### Effect of American Locomotive Company's Annual Meeting on Alco Production— Reports Show Many Concerns Have Enjoyed a Good Year's Business.

**I**T WOULD appear that the decision of the American Locomotive Company to abandon the manufacture of Alco cars and trucks was definitely determined by the action of the stockholders at the annual meeting of the company in New York City, Oct. 21. Since announcement of this decision was made by the board of directors in August, a number of circumstances have arisen, as a result of which there has been some question as to the possibility of a reversal in policy.

Several stockholders, headed by Isaac M. Cate, were present or were represented at the annual meeting to urge the appointment of an investigating committee composed of men outside the company, which should take up the whole question of management, etc. This proposition was defeated by a substantial majority. President Marshall delivered a statement answering many of the criticisms, and promised to explain, in the near future, other points raised during the meeting.

Some of these were brought up by President Seelye of Smith College, Northampton, Mass., who represented the holdings of that institution in the company. Mr. Seelye desired particularly to learn why it had become necessary to devote a large sum from the profits of the company toward a deficit in the automobile department. Mr. Marshall promised to take up this matter in his forthcoming statement.

#### MONDEX-MAGIC CARS.

#### Chassis to Be Produced by Palmer-Singer People for Aristos Company.

Coincident with the announcement that the Aristos Company of New York City was to make display of cars at the forthcoming show in that city, comes the information that the concern is to produce the Mondex-Magic in two models, a four-cylinder and a six. The chassis will be fitted with Magic motors, for which the Motor & Gear Improvement Company, 250 West 54th street, New York City, has the American rights.

It is explained that the chassis will be built by the Palmer & Singer Manufacturing Company, Long Island City, N. Y., which also will utilize Magic motors in cars bearing the Palmer-

Singer name. This concern is understood to have the only American license thus far granted for the production of Magic motors. The Aristos company is said to be closely associated with the Motor & Gear Improvement Company, and the same thing holds true of the Palmer-Singer concern.

#### WILLYS-OVERLAND EARNINGS.

#### Preliminary Statement Shows Net Business of Over \$5,000,000.

The Willys-Overland Company, Toledo, O., has released certain figures concerning the year's business previous to the publication of the annual report, in which it is noted that the net earnings of the company were over \$5,000,000. The preliminary statement follows:

|   |                    |
|---|--------------------|
| Net earnings, from operation of all companies, after deducting all expenses, including an adequate allowance for accruing renewals and depreciation ..... | \$5,705,537        |
| Interest on notes and accounts receivable, etc..  | 176,829            |
| <b>Total income.....</b>  | <b>\$5,882,367</b> |
| Interest on floating debt.....  | 228,468            |
| <b>Surplus.....</b>   | <b>\$5,653,898</b> |
| Preferred dividend .....  | 350,000            |
| <b>Surplus.....</b>   | <b>\$5,303,898</b> |

#### PAYS STOCK DIVIDEND.

#### Packard Motor Car Company Increases Capital to \$16,000,000.

At the annual meeting of the Packard Motor Car Company, Detroit, the stockholders approved the recommendation of the directors for the distribution of a stock dividend of 40 per cent. in common stock among owners of such stock in the company. In addition, the capital of the company was increased from \$10,000,000 to \$16,000,000, by adding \$3,000,000 to the common and a like amount to the preferred, thus raising the total of each from \$5,000,000 to \$8,000,000. Practically all of the stockholders acquiesced in the plan of waiving their right to subscribe to the \$1,000,000 of new common which will remain after the stock dividend, and similar action was taken with respect to the \$3,000,000 of the new preferred stock.



President H. B. Joy explains that this action is merely the execution of a plan which has been in evolution for about two years. The stock dividend will be the first payment made to owners of common stock in about four years, during which earnings have been applied to increasing capital investment by making additions to the plant and other improvements. Mr. Joy adds that about \$1,000,000 of Packard stock is owned by Packard employees, who have availed themselves of the opportunity to acquire it at par.

### REO HAS GOOD YEAR.

**Business Is Largest in Its History and Surplus Reaches \$2,000,000.**

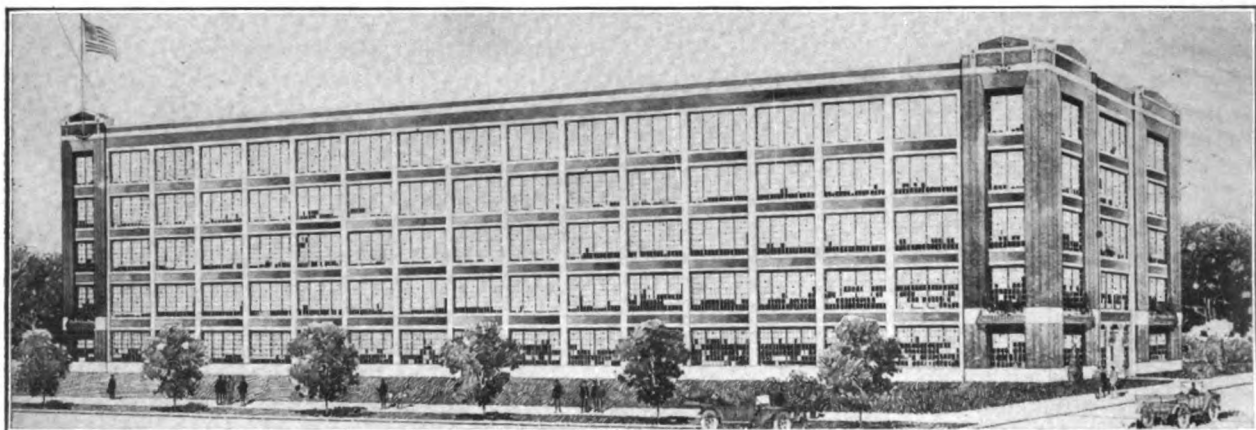
According to the report presented at the annual meeting of the Reo Motor Car Company,

### NEW FACTORY IS COMPLETED.

**Gray & Davis Claims It Has Largest Plant of Its Kind in the World.**

What is claimed to be the largest factory in the world devoted exclusively to the production of electric lighting and motor starting systems, has just been completed by Gray & Davis, Inc., on the bank of the Charles river in Cambridge, Mass. The new plant will afford employment for nearly 1000 men, and has a total floor space of 180,000 feet. The material is reinforced concrete with tapestry brick exterior.

The main building is 380 feet long, 60 feet wide and five stories high, while in the rear is an extension comprising 10 stories, each story being one-half the height of those in the main structure. In this extension there will be located



Recently Completed Factory of Gray & Davis, Inc., on the Bank of the Charles River in Cambridge, Mass.

Lansing, Mich., during the present month, the concern enjoyed the best business in its history, and ends the fiscal year with a surplus of over \$2,000,000. Considerable money was expended in increasing facilities, by the erection of a warehouse and various other additions, and the acquisition of machinery equipment. The management will remain the same during the coming year. The report shows the following:

| Assets.                                    |                |
|--|----------------|
| Capital assets—                            |                |
| Real estate, buildings, etc.....           | \$2,019,356.17 |
| Current assets—                            |                |
| Inventories, accounts receivable, etc..... | 1,312,734.42   |
| Cash on hand and in banks.....             | 885,383.61     |
| Total.....                                 | \$4,217,474.20 |
| Liabilities.                               |                |
| Capital stock .....                        | \$2,000,000.00 |
| Current liabilities .....                  | 155,586.80     |
| Surplus account .....                      | 2,061,887.40   |
| Total.....                                 | \$4,217,474.20 |

the lockers, wash rooms, pattern vaults, etc.

On the ground floor of the main building are the heavy duty machines, presses, stamp mills, etc., buffing and hardening rooms. The raw material comes in on this floor and will be distributed by a miniature railroad. The second floor contains the general offices, private offices of the heads of all departments, stockroom, wiring room and battery department. The assembling and light machine work will be done on the third floor, and over half of the space will be devoted to testing and inspection rooms. The manufacture of all small parts and detailed electrical work will be done on the fourth floor, with some little room left for the experimental department. The electrical engineers, the draughting rooms and the office of the chief engineer will be on the top floor, also a restaurant and rest rooms for employees.



**MORE MONEY FOR SIMPLEX.****Increased Capital to Take Care of Product of Its New Brunswick Factory.**

The Simplex Automobile Company, New York City, has been reincorporated under the laws of Delaware for \$1,500,000, which represents an increase in capital of \$500,000. It is understood that this additional money was needed to take care of the increased business made possible by the new factory in New Brunswick, N. J. The new officers of the concern are: President, Henry Lockhart, Jr.; first vice president, Otto Boessneck; second vice president, J. Hopkins Smith, Jr.; secretary and treasurer, C. T. Neubourg. The directors comprise the above officers and Hobart J. Park, C. C. Goodrich, Hugo Boessneck, Robert Behr, G. V. Lansing, John D. Dale and G. E. Franquist.

Messrs. Lockhart, Smith and Goodrich are members of the banking firm of Goodrich, Lockhart & Smith, New York City, while Mr. Goodrich also is a director in the B. F. Goodrich Company. Mr. Park formerly was president of Park & Tilford, New York City. Messrs. Boessneck are members of the firm of Boessneck, Broesel & Co.; Mr. Behr of Robert Behr & Co.; Mr. Lansing, a director of the Commercial National Bank, Albany, N. Y., and president of the Albany Garage Company. Mr. Dale has been sales manager of the Simplex company, and Mr. Franquist, its superintendent and designer. Herman A. Broesel, who has been with the company since its formation, will be manager of the service department, and Carl A. Broesel will be located at New Brunswick.

**ANOTHER DETROIT CAR.****S. & M. Motor Company, Recently Organized, Secures Necessary Plant.**

Detroit is to have still another motor car manufacturer, in the S. & M. Motor Company, which has secured a factory containing 50,000 square feet of floor space at 1900 Mt. Elliott avenue, and will begin at once the production of S. & M. cars. The following men are among those interested in the concern: Edward E. Stroebel, a furniture manufacturer in New York City, and Walter C. Martin, formerly a New York City dealer in Cadillac cars.

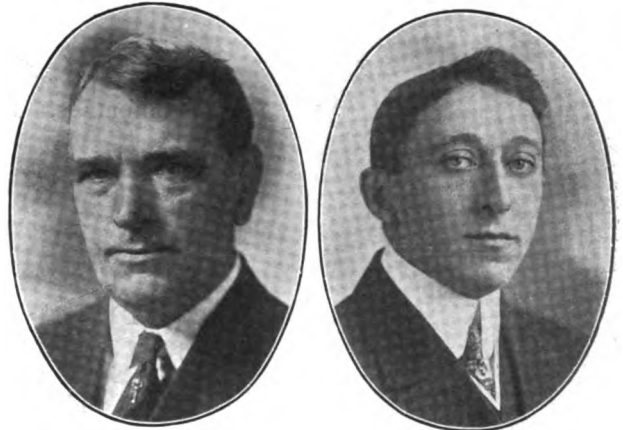
It is understood that Mr. Martin is largely responsible for the design of the new machine, which is to be constructed primarily to meet the

demand, which he believes exists, for a strictly high grade standardized car. Four body designs will be produced.

**MAKE KELLY TRUCKS.****Two Men Who Have Succeeded Well in the Country of Their Adoption.**

Two men who are largely responsible for the success of the Kelly-Springfield Motor Truck Company, Springfield, O., maker of Kelly trucks, are President James L. Geddes and Chief Engineer Charles Balough. The former was born on a farm near Banffshire, Scotland, March 16, 1857, and the latter in Nagy-Lak, Hungary, in 1883.

Mr. Geddes secured his education in the schools of Aberdeen, and came to this country in



At Left, President James L. Geddes; at Right, Chief Engineer Charles Balough, Kelly-Springfield Motor Truck Company.

1874. Later he became connected with the Grand Trunk railroad, and when he left that concern in 1899 he was auditor of the car department for the entire Grand Trunk system, with headquarters in Montreal. He next became general manager of the Detroit City Gas Company, with title of auditor, and later was its treasurer. This company is controlled by the Emerson McMillan Company, 40 Wall street, New York City, which has varied interests throughout the country, and Mr. Geddes represented it in several capacities. He became president of the Kelly-Springfield company in April.

Mr. Balough was educated in Budapest, and in 1902 was graduated from the Royal St. Joseph University with the degree of mechanical engineer. He came to America in 1903, since which time he has been connected with the engineering department of the following concerns: Northern Motor Car Company. Great Lake Engineer-



ing Works, Ford Motor Company, Cadillac Motor Car Company and General Motors Company. He was appointed chief engineer of the Kelly-Springfield company in July, 1910.

### WILLYS ASSUMES MANAGEMENT.

#### Promotion for Other Officials—Purchase of Connecticut Plant.

John N. Willys, president of the Willys-Overland, has announced that, owing to the death of Vice President George W. Bennett, he will resume the entire management of the business. In line with his belief in the principle of promotion, C. S. Jameson, formerly one of the sales managers, has been elected director and second vice



John N. Willys, President, Willys-Overland Company.

president, in charge of sales, of the Willys-Overland and subsidiary companies. H. B. Harper becomes sales manager and D. W. James, assistant to the president.

The company has purchased the plant and business of the Globe Ball Bearing Company of Norwich, Conn., and the machinery will be removed to Elmira, N. Y., where it will be re-established in connection with the Morrow Manufacturing Company, another subsidiary. It is announced that the purchase will enable the production of the few small parts which it has heretofore been called upon to purchase outside, so that in the future every part of Overland cars will be made by the company and its subsidiaries.

### SECURES NEW QUARTERS.

#### Red Head Spark Plugs Now Located in Bush Terminal Building.

In order to increase its manufacturing and shipping facilities, the Emil Grossman Company,

maker of Red Head spark plugs, has consolidated its Detroit and New York factories under one roof in the spacious Bush Terminal building, factory No. 20, at 41st street and Second avenue, Brooklyn, N. Y. The Detroit plant will be continued as the western branch, where ample stock will be carried for the western trade. The porcelain factory in Trenton, N. J., where several kilns recently have been built and three new buildings are now being erected, will not be disturbed.

The new Red Head spark plug headquarters will embrace 31,000 square feet of floor space, all on one floor. This increase will permit of the installation of a battery of specially designed machinery, nickel and brass plating, and enamelling equipment, which will enable the company to regulate the speed and control of workmanship on every operation in the production of its goods. Shipments, instead of being hauled for miles through New York's crowded streets to congested freight yards, will be loaded directly into cars right at the door and immediately dispatched.

### ENTERS LARGER FIELD.

#### Henry L. Hornberger Establishes Himself as Pacific Coast Distributor.

Henry L. Hornberger, who is one of the best known automobile men on the Pacific Coast, and who opened the first factory branch of the Oakland Motor Car Company in that territory, has decided to engage in business for himself, as Pacific Coast distributor for three well known lines. His resignation from the Oakland branch in July was followed by a period of speculation as to his future activities. His headquarters will be located in San Francisco, and he will cover the states of California, Oregon, Washington, Idaho, Nevada and Arizona, and British Columbia in Canada.

Mr. Hornberger is primarily a gasoline car man, and it occasions no surprise that he has decided upon the Palmer-Singer, made by the Palmer & Singer Manufacturing Company, Long Island City, N. Y., as one of the lines which he will handle. He has added the Brown internal gear driven truck, made by the Brown Commercial Car Company, Peru, Ind., to care for the commercial vehicle end of the industry.

During the past few months he has been studying the situation in this district with a view to supplying an electric pleasure car, for which he believes a large demand can be developed. On his recent eastern trip he spent a few days at



the factory of the Borland-Grannis Company, Chicago, where he examined the Borland electric line and became somewhat enthusiastic concerning its features, with the result that this make has been added as the third member of the line to be represented by him.

#### A CO-OPERATIVE PLAN.

##### Kearns Motor Truck Company Admits Employees as Stockholders.

The Kearns Motor Truck Company, Beavertown, Penn., has been incorporated under the laws of Delaware for \$100,000, \$40,000 of which is six per cent. cumulative preferred and \$60,000 common. The par value of the shares is \$10. The incorporation is on the co-operative basis, employees, from the lowest salaried up, having taken stock, these including those in the sales end.

The owners of the business have taken \$40,000 of the common stock, to reimburse them in part for the experimentation, good will, etc. The balance of \$20,000 common is to be divided among the preferred stockholders, at the rate of one share of common gratis with every two shares of preferred.

Those responsible for the business have been producing the Kearns truck during the past eight years, and have been engaged in the manufacture of carriages and wagons for 25 years. The company has succeeded in having its trade mark "Gearless" registered through the United States patent office.

#### TO LOCATE IN DAYTON?

##### Officials of Grant Motor Company Apparently Pleased with That City.

According to a dispatch from Dayton, O., President George D. Grant, General Manager George S. Waite and Treasurer H. S. Shaw of the Grant Motor Company, now of Detroit, were recent visitors in that city for the purpose of inspecting sites for the location of a factory. The company was organized recently for the production of a low priced car of the roadster type, and the capital has lately been increased to \$200,000. It is anticipated that a large number of cars will be produced during the 1914 season.

The Detroit guests were met by the local Grant representative, M. D. Thomas, and committees from the Greater Dayton Association, and they are said to have expressed their surprise and pleasure at the opportunities offered by the

Ohio city. Indeed, Mr. Thomas felt justified in saying that there was practical assurance that the plant would be removed to Dayton.

#### RETURNS TO BOSTON.

##### William B. Fewell Succeeds Fred Walsh as Manager of Oakland Branch.

Succeeding Fred Walsh, who has resigned to go to the Pacific Coast, William B. Fewell, for a long time associated with the industry in Boston, has returned to that city as manager of the Oakland branch. He has until recently been manager of the Oakland branch in New York City, going to that concern from the New England division of the Olds Motor Works in Boston.

Mr. Fewell is a native of Springfield, Mass., and gained his original automobile experience with the Locomobile Company of America, being connected with that concern for a number of years in the earlier days of the industry. For a long time he was its travelling representative, with the result that he



William B. Fewell, Manager, Boston Oakland Branch.

came in direct contact with a large number of men engaged in the trade throughout New England and the East.

Upon leaving the Locomobile people he became associated with the Oldsmobile in St. Louis, working his way to the position of manager of that branch. Naturally, this increased his circle of friends and acquaintances very materially. It was from St. Louis that he was transferred to Boston, still with the Oldsmobile interests. His many friends throughout the country will be glad to learn of his return to that city.

When the Ford Motor Company, Detroit, closed its fiscal year, Sept. 30, approximately 325,000 model T Ford cars were in use throughout the world.



# NEW AND NOVEL ACCESSORIES THAT APPEAL TO MOTORISTS

## Dayton License Holder.

The Dayton Malleable Iron Company, Dayton, O., is manufacturing two new designs of license plate holders. The front style comprises two right angle arms, also a clamping construction, fitting around the filler member of the radiator. The securing device differs from conventional design in that it is made to clamp around oblong or round filler members. It is locked by a bolt and nut. The rear design is made with a combination socket, permitting of its use with either a round or flat lamp iron, and assures proper illumination of the number plate. Both styles have adjustable means, thumb nuts and lock washers.

## Pruden Auto Chair.

The W. E. Pruden Hardware Company, 260 West 52nd street, New York City, is marketing three styles of collapsible automobile chairs which may be folded very compactly and utilized when an extra passenger is to be carried. They are made in three sizes, that for a child being 12 inches, the medium 15 and the large 17. They have comfortable seats and backs, upholstered in maroon or black leather, and the entire construction is substantial as well as light.

## Masco Air Gauge.

The service obtained from tires depends largely upon the owner. One of the most important rules for the motorist to observe is proper inflation of the shoes and every manufacturer recommends the use of a tire gauge when fitting a casing and in service. The Motorcycle Accessories Company, St. Paul, Minn., is marketing the Masco air gauge, which differs from usual design in that it is permanently attached to the valve stem by a lock nut. The dial is approximately the size of a 10-cent piece, calibrated, and a watch hand denotes the pressure. It makes for convenience in that the hand may be watched while inflating the tire. The dial is protected by a hinged lid. The device is very compact and as will be noted by the accompanying illustration, is fitted with a conventional type of valve cap.

## Ten Eyck Automatic Air Pump.

The Ten Eyck Pump Company, Auburn, N. Y., is producing the Ten Eyck automatic air pump, which is designed for service with motor starting systems and for inflating tires. When utilized on the motor car the gear-shift is automatically controlled by a separate cylinder and piston, which is operated by the pressure in the storage tank or the tire. The back pressure from the air receiver slides the pump gear into mesh with the driving gear, the pump gear running idle until the two gears are partly meshed. The clutch is then engaged. Discon-

necting the pump from the air receiver allows the pressure to escape from the automatic cylinder and the gears are disengaged by means of a spring. In this operation the clutch is first disengaged, permitting the pump gear to run idle while being drawn out of mesh. This arrangement makes easy engagement and disengagement of the gears without reducing the motor speed. When the pump is utilized in connection with a storage tank for starting purposes, a special air valve and pressure gauge is inserted in the pipe between the pump and the tank, and is usually mounted on the dash. The operation of this valve is automatic. The Ten Eyck pump is 10 by 4.5 inches, weighs 10 pounds and has a capacity of two cubic feet a minute. All parts are constructed of high grade material and the workmanship is first class in every respect. The equipment includes 15 feet of rubber tubing, pressure gauge and hose fittings.

## XXX Spark Plug.

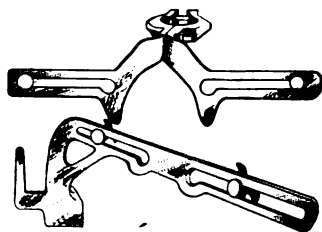
The XXX Auto Accessory Company, Springfield, Mass., is manufacturing a novel spark plug termed the XXX, which is sold under a money-back guarantee. The feature of the plug is the use of detachable electrodes, a design permitting of replacement of damaged or burned members at a very slight expense and without difficulty. The gap is double with this plug, and there are a number of interesting features which are explained in the booklet issued by the company. It will be mailed free on request.

## Auto-Queen Wrench Set.

The C. M. B. Wrench Company, Garwood, N. J., is manufacturing the Auto-Queen wrench set, which is specially designed for motor car work. The No. 11 set includes a ratchet wrench, universal joint, long extension, screw driver, spark plug socket and 15 sockets. The last named members provide for hexagon parts from .25 to .625 inches, cap screws from .25 to .5625 inch and square from .25 to .375 inch. The outfit comes in a neat, substantial hard wood box. Its weight is seven pounds. The No. 12 set is less expensive and not as complete, but includes sufficient sockets, etc., to complete ordinary work. The company also manufactures wrench equipments for factories and for machinists.

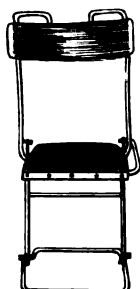
## Ka-Ha-Co Horn.

The Kales-Haskel Company, Detroit, announces the Ka-Ha-Co electric horn, with which it is stated a powerful note is obtained without harshness. The construction is simple, well known electrical engineering principles being utilized, and it is stated that its service cannot be impaired, except through injury. It comes finished in brass and black, also nickel and black, the latter type costing \$1 more. The horn is moderately priced and with



Dayton License Holder

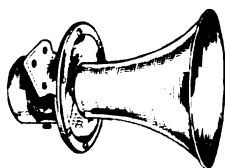
Pruden Auto Chair



Masco Air Gauge

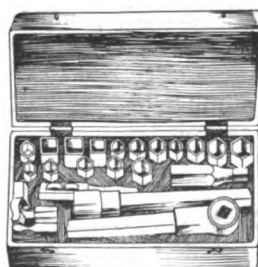


XXX Spark Plug

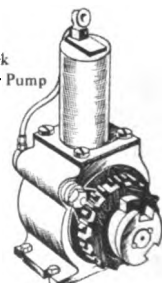


Ka-Ha-Co Horn

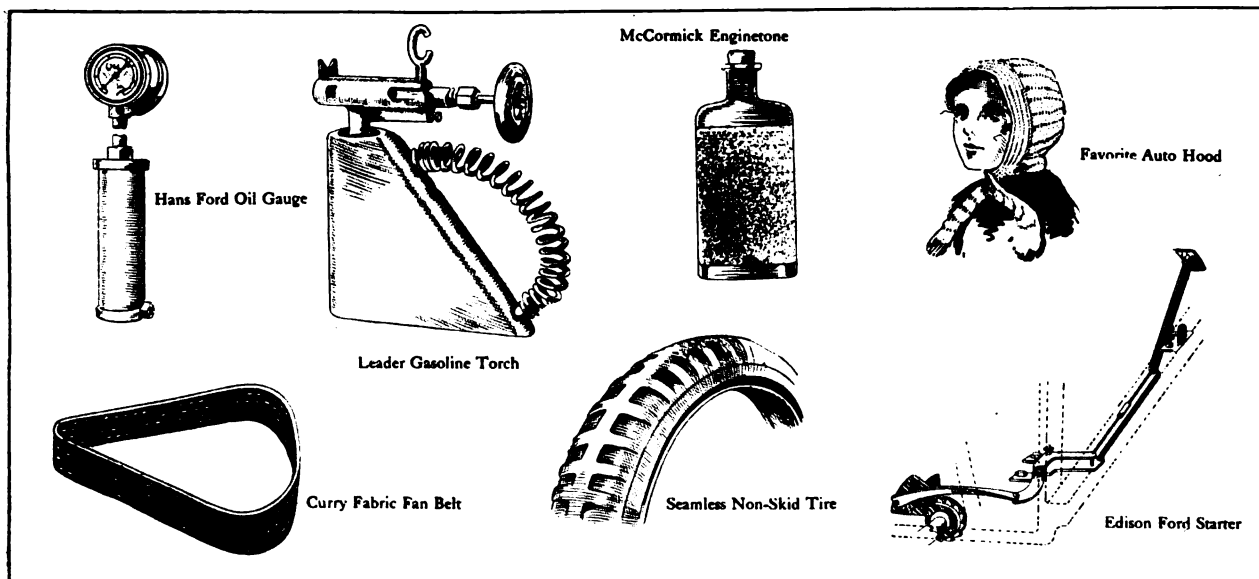
Auto-Queen Wrench Set



Ten Eyck Automatic Air Pump







it is furnished suitable length of cable and push button.

#### **Hans Ford Oil Gauge.**

The American Auto Supply Company, 1741 Broadway, New York, is marketing the Hans Ford oil gauge, which differs from the usual lubricator indicators, in that it is placed on the dash in plain view of the operator, and it is stated that the height of the oil in the crankcase is accurately shown. A float chamber is connected to the crankcase of the motor by a close nipple or pipe, and the float with the indicating dial, so that any change in the float chamber is instantly shown on the dial. It is supplied complete with all fittings, etc., and instructions. It is designed for attachment to 1911, 1912 and 1913 model T Ford cars.

#### **Leader Gasoline Torch.**

A torch is a valuable addition to the garage equipment, as it may be utilized for a number of useful purposes, such as heating soldering irons, starting frozen nuts, etc. The Leader Manufacturing Company, Cleveland, O., is producing a compact blow torch, which is equipped with a device for retaining the iron. Soldered joints or seams are eliminated by the construction and the torch is fitted with an Alaska wire coil handle, permitting of easy handling without danger of burning the hand.

#### **McCormick Enginetone.**

The McCormick Manufacturing Company, Dayton, O., is offering a carbon destroyer called Enginetone, which is a chemical preparation, a fluid, supplied in a bottle. It is stated that it does not contain any oil, acid or explosive, or inflammable material. It is used in proportions of a teaspoonful to a cylinder and it is said that it will break up carbon without injury to the metal. Each bottle contains six ounces.

#### **Favorite Auto Hood.**

The Favorite Knitting Mills, successor to A. J. Mandel & Co., 1388 West Sixth street, Cleveland, O., is manufacturing a practical article for women and children who motor, termed the Favorite auto hood. The design is not only neat appearing, but it protects the head of the user and the shape and material makes for decided comfort. It is made in differing sizes, in all wool worsted, fibre silk and mercerized. A wide variety of shades is offered and the price is very moderate. One of the features of the Favorite auto hood is that it keeps the hair shapely when motoring.

#### **Curry Fabric Fan Belt.**

One of the objections to belt drive is that the material will stretch in service, due to atmospheric changes, oils, etc. The C. & B. Hinson Company, Grove and Liddell streets, Cincinnati, O., is manufacturing the Curry fabric automobile fan belt, which it is stated will withstand oils, greases, heat, etc., and it is also claimed that it will not stretch after service. The belts are woven by special

machinery, of a high grade upland cotton and linen thread, then treated by a secret process which renders them proof against the troubles outlined above. The belts are made endless, to fit any design of fan pulley on the motor and are moderately priced. The company makes a specialty of belts for model T Ford cars, and is prepared to supply them in any lengths, furnishing a special belt fastener. The Curry belting is also made in rolls for the trade, and of standard dimensions.

#### **Seamless Non-Skid Tire.**

The Seamless Rubber Company of New York City, with factories at New Haven, Conn., offers the Seamless non-skid tire, which is constructed of the same high grade material and workmanship as the other products of this concern. The company lays special emphasis on the fact that it employs only the pure Brazilian Para rubber and the finest of Sea Island cotton, which is specially woven and cut diagonally to obtain the maximum amount of flexibility and tensile strength. The company employs the single cure process and each casing is covered by the usual 3500-mile guarantee. The Waite Auto Supply Company, Providence, R. I., is Rhode Island distributor.

#### **Edison Ford Starter.**

The Consolidated Gas & Electric Company, 552 West Lake street, Chicago, is marketing the 1914 model Edison starter for model T Ford automobiles. It is a mechanical motor starter, operated from the seat, and it is stated that little exertion is required to spin the engine as the leverage is compounded. Energy is applied through suitable linkage to the ratchet wheel on the crankshaft, a pawl engaging with this gear, but provided with a device to compensate for any back fire of the motor. It is stated that the system can be applied without alterations and that no tools other than a wrench and hammer are necessary. It does not interfere with the use of the usual starting crank, which is retained. The company also manufactures a model for the K-R-I-T, Regal and Studebaker cars.

#### **Arbeco Glass Lamp.**

A novelty in lamp design is noted in the Arbeco, manufactured by the Reynolds-Browne Company, 1312 Michigan avenue, Chicago. It is an all glass lamp constructed both for headlight and side light use, weighs less than the usual metal electrical units and the material should make for easy cleaning as well as for efficiency. While it would appear that a glass lamp would invite easy breakage on a motor car, the maker claims that it is as durable as a metal unit, insofar as service is concerned. Between the reflector and the shell is a vacuum space which serves to prevent heat from within or without from creating undesirable temperatures, and the construction also protects the inner plating of metal that gives the lamp its finish. Inside of the shell or main



body is plated a layer of brass, nickel or copper, of a color to match the car. The reflector is a true parabola, this being silvered on the inside, where it is protected from atmospheric changes and not affected by cleaning. The only metal used is the door frame and the jamb. A focal adjustment is included, also a wired socket. The Arbco lamp is made in different sizes to meet requirements.

#### Motophone Horn.

The Automobile Supply Manufacturing Company, 220 Taaffe Place, Brooklyn, N. Y., is introducing a new horn known as the Motophone. It is mechanically operated, a slight pressure on a conveniently located lever resulting in a loud, steady, pleasant sound. The operating mechanism has been perfected by the maker after long experimentation and it is stated that in a test 5,000,000 signals were given without any adjustment being necessary. The maker calls attention to the convenience of the signal, in that its operation does not depend upon batteries. Throughout the workmanship and material is in keeping with the high grade product for which the concern is noted.

#### A. A. S. Priming Cup.

With the approach of cool weather more or less trouble will be experienced in starting a cold motor. While the majority of manufacturers make provision for priming, a large number of cars are not equipped with

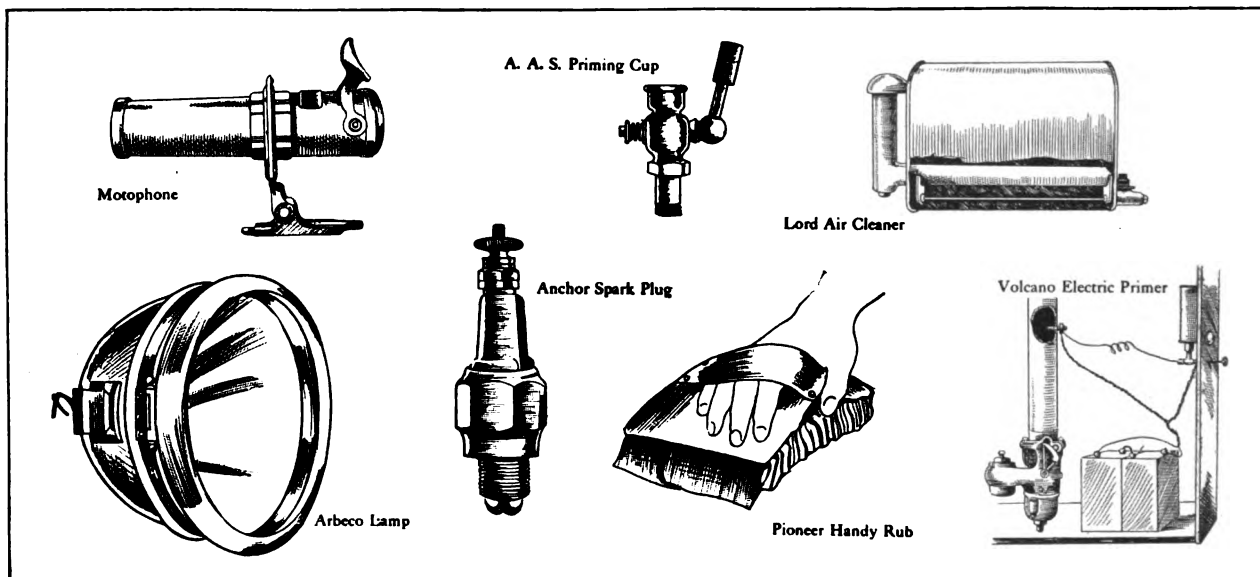
sion chamber, thence through an opening to the air intake of the carburetor. Provision is made for replenishing the supply of oil as well as draining the old lubricant.

#### Anchor Spark Plug.

The Szel Import & Export Company, 359 Broadway, New York City, is marketing the Anchor spark plug, so-called from the design of the central electrode which terminates in two arms, having much the appearance of the flukes of an anchor. Another radical departure from conventional spark plug construction in the method utilized to prevent oil being splashed onto the porcelain, thereby depositing soot and eventually creating a short circuit and faulty operation of the plug. A cap is utilized on the Anchor plug, through which extends the central electrode, but the cap is so designed and located that the high-tension current cannot jump from it to the base of the shell, owing to the high resistance encountered. It is pointed out by the maker that any oil splashing onto the cap would be consumed by the heat of combustion. The electrode is of nickel. The plug is moderately priced.

#### Pioneer Handy Rub.

In polishing brass with ordinary cloths and waste the hands are more or less soiled by the cleansing material. The Northwestern Chemical Company, Marietta, O., is marketing the Pioneer handy rub, which is a polish-



priming cups. The American Automobile Supply Company, 1741 Broadway, New York City, and 1408 Michigan avenue, Chicago, markets a number of inexpensive, high grade priming cups, one of which is shown in an accompanying illustration. The cup is constructed of the best quality brass, carefully machined and nicely finished. It is fitted with spring key and cotter pin and it is stated it will not jar loose or leak. This design is furnished nickel plated and has a fibre handle, enabling opening of the cock when the motor is hot. The priming cup is made in .125 and .25-inch threads and weighs about four ounces.

#### Lord Air Cleaner.

Analysis of deposits on the pistons and cylinder heads has disclosed the presence of more or less road dust and other foreign elements. That clean air aids in carburetion, in that a better mixture is obtained, is conceded, and the presence of dust and dirt does not improve the operation of the carburetor. Many devices have been offered for preventing the entrance of foreign elements into the carburetor, including screens, etc., but a variation is noted in the Lord air cleaner marketed by the Lord Manufacturing Company, Brooklyn, N. Y. It is screenless, oil being utilized to separate foreign elements from the air on its way to the carburetor. The air enters an umbrella shaped opening and, in passing through a chamber containing oil, the lubricant attracts the impurities by adhesion. The air then flows to an expan-

ing device composed of strips of genuine oil tanned chamois sewed to a canvas back equipped with a practical retaining band for the hand. The maker states that it lightens the work of polishing brass, cleaning glass or the woodwork, and that the material is very durable and imparts a fine polish without danger of scratching the surface treated. It is inexpensive.

#### Volcano Electric Primer.

The Volcano Electric Primer Works, Virginia, Ill., is marketing a priming device called the Volcano electric primer, which utilizes electricity for vaporizing the fuel and which is easily operated. A small container is located inside the dash and has a line connecting with a small cup like device which is inserted in the intake pipe. Gasoline is supplied to a plate over the cup by the capillary process, a wick being employed to feed the fuel. The capacity of the cup member is very small and is suitably proportioned to make an easy starting mixture. Connected to the plate are two wires from a storage battery or dry cells, and by closing the circuit with the usual push button, the plate is heated, causing the fuel to vaporize. This makes for easy starting of the motor when cold, as not only is the mixture enriched, but it is vaporized by the rise in temperature. It is stated that the dash container has a capacity for about 150 starts without replenishing the supply of fuel. The device is easily installed and the connection may be made to the battery without interfering with the usual wiring plans.



### TESTING A KISSELKAR.

#### Los Angeles Man Tells of His Recent 3500-Mile Trip in the Mountains.

D. A. Whitaker, vice president, and W. R. Letton, secretary-treasurer of the Union Stock Yards Company, Los Angeles, recently completed a 3500-mile camping trip through the mountains of California, in a 60 horsepower KisselKar, made by the Kissel Motor Car Company, Hartford, Wis. Mr. Whitaker describes the journey as follows:

We loaded our camp outfit on board my KisselKar "60," including 1200 pounds of baggage and four weeks' provisions, and started north out of Los Angeles, through the Antelope valley and across the Mojave desert, where we found an ocean of sand. After leaving Mojave we ran into a number of water spouts, which washed out much of the road and all of the bridges. We took the lead of 13 machines, and there were only three of them that went through that day.

We drove to Freeman and stayed over night. Then we went through Lone Pine, Independence and Bishop. There we struck Dead Man's grade, which I believe to be one of the roughest and steepest grades in the State of California. We proceeded on our journey up to Mono Mills, a summit of 8000 feet, then down to Mono lake, through sand and boulders. The road we travelled over down to the lake has not yet been built. There we met Wallace MacPherson, the manager of the Mono Valley Improvement Company, and received the best of camp accommodations. We bought lubricating oil, which proved to be nothing but plain crude oil just out of the well, but it was all we could get. We filled the crankcase and started for Silver Lake. I believe the KisselKar would do its work on soap grease if it could get nothing better.

We arrived at Silver Lake, about 9500 feet elevation, where we won new laurels by taking our car and dragging the biggest pine log into the camp for fire purposes. I sometimes think if I had mudhooks on the car I could climb any mountain in the Sierra Nevada range. During our stay there we made a side trip through Bridgeport, while a big 90 horsepower machine and another car failed. We made the return trip of 78 miles in 7.5 hours, over mountain and sand roads.

On the return to Los Angeles we came over Gas Pipe grade, by way of Benton. This is one of the most crooked and sandy grades I ever saw. It is nine miles of constant climbing. I made most of it on the second gear. When we struck Red Rock canyon we were in the lead and just at this point the "90" refused to move. All that was left to do was to hook it on behind the KisselKar and draw it in. One of the party wanted to bet me his ranch that we could not move it, but when we turned on steam it rolled along as though it was hooked to a traction engine. We pulled it clear through Red Rock canyon to the Mojave desert. A good demonstration in the right place tells the story.

### MOLINE UPHOLSTERY.

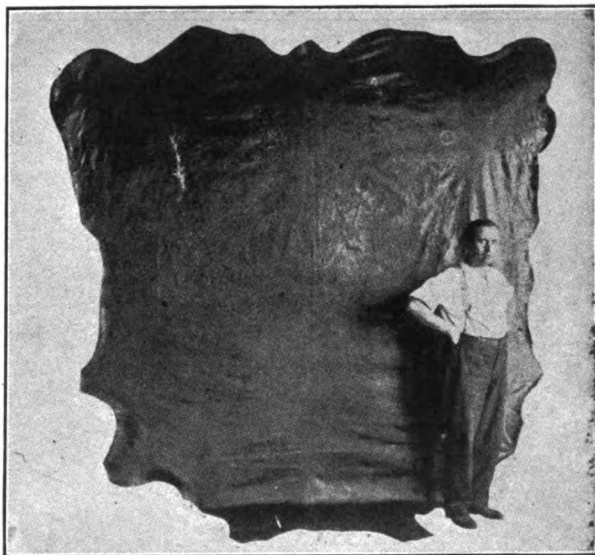
#### President Van Dervoort Specifies That This Shall Be of the Best Quality.

Without detracting one whit from the efforts of the designers and engineers in the production of Moline cars, made by the Moline Automobile Company, East Moline, Ill., it is possible to call special attention to the upholstery, a point concerning which President W. H. Van Dervoort is

very particular. An accompanying illustration shows one of the steer hides used in the Moline factory, and indicates its size compared with that of the workman. This skin covers an area of 86 square feet and is the outside cut, next to the hair—the only cut used by this company.

President Van Dervoort maintains that Moline cars are made for those who demand the best; for those who are accustomed to costly furniture, grand opera, art masterpieces and the costliest that the market and craftsmanship of the world offers. Therefore, the upholstery, as well as every other factor comprising the completed car, must be of the best quality.

Cushions must be stuffed hard enough to carry the load and hold their original shape, yet they must not be so hard that they are uncomfortable.



Size of the Steer Hides Used in Upholstery on Moline Cars Compared with That of Workman.

There must be enough leather to cover the body thoroughly, yet it must not sag or draw too tightly, and every seam must be sewed to remain closed no matter what the strain. "Quality is the Moline by-word", says Mr. Van Dervoort, "and it is not our intention to slight the bodies and top work any more than we would slight the making of the chassis."

Harvey Granger, president of the Savannah Automobile Club, Savannah, Ga., under whose auspices the Vanderbilt Cup and Grand Prize races were to have been held next month, has notified the Motor Cups Holding Company of New York City that it will be impossible to stage the events as planned.



## WITH THE MOTORING INTERESTS ABROAD.

### Sunbeam Car Recaptures World's 12-Hour Record, Taken from It by Argyll in May---Crespelle and Schneider Machines Are Winners in Gaillon Climb.

**T**HREE drivers, by taking turns at the wheel, established a new 12-hour world's record on the Brooklands track, Weybridge, England, early in the month. The car was a six-cylinder Sunbeam, made in England, and the distance covered was 1078 miles 460 yards. The previous record was held by an Argyll, fitted with single-sleeve valve engine, which covered 914 miles 640 yards on the same track, May 27. The Argyll replaced a Sunbeam for this world's mark.

Crespelle in a Crespelle car took the classic Gaillon hill climb at Berbe, France, driving the kilometer in 35 seconds flat. Gabriel in a Schneider won in the touring car class, his time being 0:38.3. The only American car to finish was a

tachment is connected permanently to the frame of the vehicle, instead of being hauled by the latter as a separate implement.

Two driving wheels of large diameter, fitted with deep paddles to increase their grip upon the soil, are mounted at the centre of the frame, which is supported from the main axle and practically is balanced in a horizontal position. The motor, which with the radiator is carried at the extreme forward end, is rated at 42-50 horsepower, and is equipped with Bosch ignition and a carburetor designed to operate on gasoline, benzol or other similar fuels.

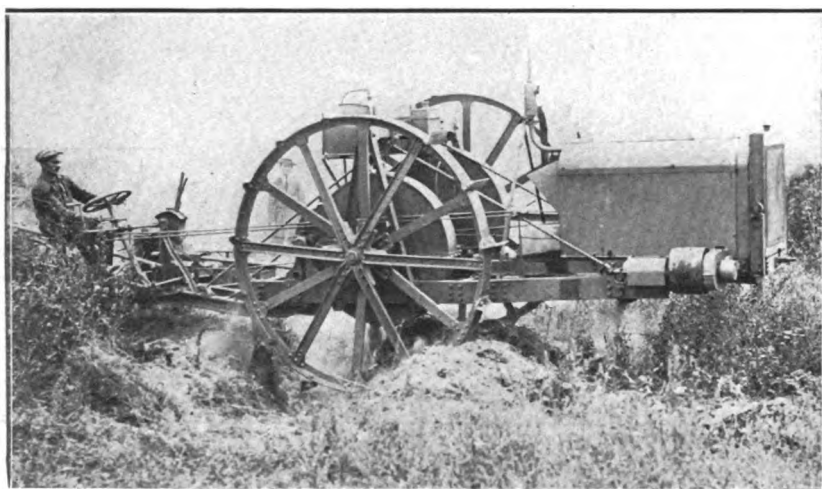
Power is transmitted through a clutch and change speed mechanism, and finally by spur gears meshing with large diameter gears on the main axle. Steering is by means of a hand wheel and irreversible gearing, which controls the movements of the single wheel pivoted at the rear and on the left side of the plowboard, which is arranged to accommodate six bottoms. This rear wheel is provided with a central flange to prevent side slipping and the steering movements are communicated to it through a long diagonal rod fitted with the usual type of ball joints.

The end of the plow frame is raised or lowered by means of a rack and pinion gear operated by a long endless chain taken from a sprocket on the end of the horizontal shaft fitted with a handle in front of the driver. It thus will be seen that one man is enabled to drive the machine and attend to the six plows.

#### TEN-YEAR-OLD LANCHESTER.

**Repeats 500-Mile Run in 24 Hours, First Undertaken a Decade Ago.**

It is, of course, unnecessary to visit England in order to find machines built 10 years ago which are still capable of giving good road service daily.



**Stock Self-Contained Motor Plow, Working in Rough Land in France.**

Buick, in the touring car division, which secured sixth place, in 0:45.2.

#### STOCK MOTOR PLOW.

**Interesting Type of Agricultural Implement Produced by German Concern.**

The Stock Motorflug, Ltd., Berlin, Germany, is said to have been very successful in the production of the Stock self-contained motor plow, illustrated herewith, and it is understood that over 700 of these have been supplied by the maker for use in Germany and elsewhere. By self-contained, it is meant that the plowing at-



However, the recent performance of a 1903 Lanchester model, owned by C. W. Dixon, now of Great Roke, Witley, Surrey, England, in repeating the 500-mile, 24-hour trip first successfully undertaken in October, 10 years ago, is of interest.

The machine is a 16 horsepower, air-cooled model. In 1903, soon after it was purchased, Mr. Dixon, then living in Edgbaston, Birmingham, drove it 505 miles over a scheduled route in 24:20:00, including 1:36:00 for stops in charging lamps, sending telegrams, etc. This was considered a surprising test of endurance in those days.

Mr. Dixon has had the machine in continuous use ever since. The only change that has been made in its construction is the substitution of water-cooled cylinders for the original air-cooled members, and this took place shortly after he purchased the car. Last month Mr. Dixon drove the machine over the original route, covering the mileage in 23:54:00, with 2:02:00 out for stops, these including none for attention to the car other than filling the generator or tank. The gasoline consumption on this "repeat" performance figured out at 28.3 miles to the gallon, which must be regarded as exceptionally good, considering the character of roads encountered.

### NAPIER'S ALPINE TEST.

#### Covers Long Mileage Under Observation by the Royal Automobile Club.

British manufacturers have been searching for new and novel demonstrations of their product with a view of giving the public information as to the performance of the machines under touring conditions. Recently a 1914 model, 30 horsepower Napier, driven by Arthur McDonald, left London, England, on a trip to the Austrian Alps and return—a journey on which the car covered 2106.5 miles under observation by the Royal Automobile Club of Great Britain.

Several passes were negotiated, including Mont Cenis, the Pordoi, Falzarego, Simplon and the Stelvio. The latter ascends to a height of 9041 feet, but after the car had covered more than 8000 feet it was found impossible to continue the journey owing to the fact that the road had been rendered impassable by an avalanche. It was the first test of this character given a British made machine.

At the conclusion of the run the entire machine was dismantled and it was found that only one slight mechanical adjustment was necessary, this being the tightening of one of the nuts hold-

ing the gasoline tank. The fuel consumption worked out at 18.09 miles to the gallon. Before dismantling, the machine did a flying half-mile on the Brooklands track at a speed of 62.61 miles an hour.

### NEWS NOTES FROM FOREIGN LANDS.

The maker of the Sunbeam cars in Great Britain is at work on a 12-cylinder machine, designed especially for racing purposes.

Twenty-three cars took part in the recent road race between Odessa and Ekaterinoslaw, Russia, held under the auspices of the Odessa Automobile Club. The winner was a Benz, while a Lorraine-Dietrich finished in second place.

The Society of Motor Manufacturers & Traders has decided not to hold a commercial vehicle display at Olympia, London, next year. This means that the only truck show in England during 1914 will be that held at Manchester in January.

At the exhibition in connection with the annual convention of grocers and provision men in Islington, England, the Studebaker Corporation, Detroit, was represented by three Studebaker cars, designed for light delivery work and for the use of salesmen.

The Great Western railroad of England is operating some 33 distinct motor passenger services in the Midlands and a portion of Wales. These are in the nature of feeders to the main railway system, and it is stated that they have been found immensely profitable, financially.

The Czar of Russia has taken possession of two German made cars, fitted as a travelling kitchen and pantry. The former is provided with stove, boiler, refrigerator and cupboards for the imperial silver, while the latter is intended primarily for the storage of provisions, but may be converted into a sleeping room with little difficulty.

The Gregoire company of France has recently supplied the police authorities of Paris with a nine horsepower friction driven car, the platform of which is designed as a weighing machine. This is fitted with four collapsible legs, which, when fixed to the ground, slightly raise the scales from the chassis.

A company is said to have been organized in England for the production of motor fuel from peat. It is claimed that the concern has in prospect a plant which will be able to make 1000 tons of peat yield 22 tons of tar a week, this to be treated so as to produce from 4000 to 5000 gallons of excellent motor fuel.

According to the American consul at Shanghai, China, 116 automobiles were imported into that district during 1912, of which 97 remained in Shanghai. He states that while American cars are gaining a substantial reputation in that district it should not be considered that there is a large market for automobiles, either in Shanghai or other sections of China, at least at present.

A correspondent of the Autocar, a British motoring print, states that during a recent cross-country run with a 10-12 horsepower car, he ran out of water. Stopping at a public house in Devonshire he asked for water, but was informed that owing to the dry weather none was to be had. Instead, he utilized a gallon of beer, which, he said, seemed to be a "fairly cooling agent, except when the engine boiled on a hill, and then beer spray was not pleasant."

Heath's garage, John Bright street, Birmingham, England, has taken delivery of the first electrically driven car built by Arrol-Johnston, Ltd., Dumfries, Scotland. The machine is fitted with Edison batteries, and may be regarded as a direct result of the visit of members of the Institution of Automobile Engineers of Great Britain to this country last summer. T. C. Pullinger, one of the councillors of the association, who is connected with the Dumfries concern, was so satisfactorily impressed with the electric vehicles utilizing the Edison battery in this country that he resolved to produce machines of this type for use in Great Britain.



# MECHANICAL INSTRUCTIONS FOR NEW OWNERS.

## Valve and Magneto Timing of Model H Hupmobile---Adjusting Steering Gear of Regal Cars---Fitting Ford Fan Belt---Timing K-R-I-T Valves---Light Car Hints.

**T**O OBTAIN maximum efficiency from the motor there are several factors to be considered, and one of the most important of these is that the valves open and close properly, or in other words, the motor must be timed correctly. If there be too much space between the valve stem and the tappet, the valve does not lift as it should, consequently the mixture is restricted in its entrance and the results obtained from the gases are not as satisfactory as when the timing is correct.

While it is a simple matter with adjustable tappets to regulate the operation of the valves, and to set the space between the stems and tappets according to the instructions of the maker, many motorists do not understand how to time

should be exactly in the centre as indicated. As the operation of the valves has an important bearing in the timing, displace the valve covers. It is also a good plan to remove the spark plugs so that the flywheel may be rotated easily and the effects of compression lessened.

It will be noted that the flywheel bears a number of letters and marks, I O, E C, 1 and 4, for example. These indicate the opening and closing of the valves, I O being "intake opens", E C, "exhaust closes". The figures represent the cylinders. As it is only necessary to time one cylinder, that nearest the radiator, for example, the flywheel is rotated until the mark I O 1 4 coincides with the timing mark. Before doing this, however, it is advisable to adjust the tappets, leaving a space about the thickness of a thin business card.

With the flywheel in the position above referred to, rotate the camshaft until the intake tappet of the first cylinder just begins to lift. Hold the shaft in this position and replace the chain. If these instructions are observed, the valves should be correctly timed.

The timing of the magneto is then checked up. Retard the breaker box lever fully as in operation of the car, and rotate the flywheel until the mark 1 4 C L is two inches past the crankcase mark. Remove the breaker box cover and the contact points should just begin to separate if the break is correct. If not, loosen the nut securing the magneto sprocket to the shaft, and rotate the latter until the points begin to separate. Next examine the location of the distributor brush, by displacing the cover, and note if it makes contact with the No. 1 segment or that connection leading to the spark plug of the first cylinder. Clean the distributor with a soft, dry brush. Also examine the platinum contact points, and clean and readjust these if necessary. Play in the chain may be eliminated by using shims as indicated.

In replacing the circuit breaker cover be sure that it fits properly, else dirt will find its way into the mechanism and breed trouble. It should be borne in mind that road dust is an abrasive and that the fibre block on the movable lever must therefore be kept clean. The writer recalls an instance where this part was so badly worn from the effects of dirt that it passed the cams

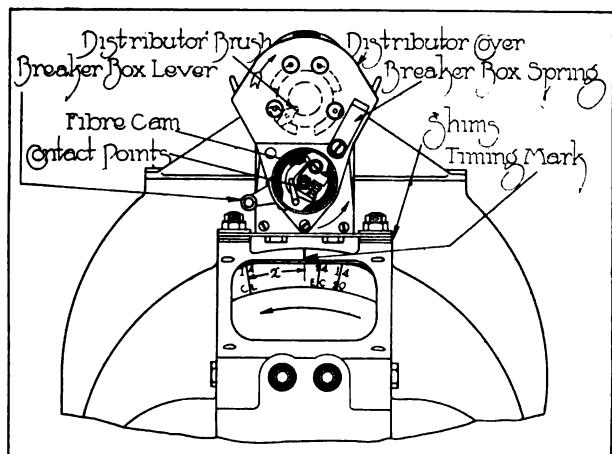


Fig. 1—Illustrating Method of Retiming Valves and Magneto on Model H Hupmobile.

the engine in the event the relation of the camshaft to the crankshaft is altered. With the camshaft actuated by gears and the teeth of the driving and driven members prick punched to insure correct remeshing, the novice can displace these components without fear of incorrect reassembly.

When chain drive is utilized, as with the model H Hupmobile, a knowledge of the timing is necessary and it will be of distinct value in timing the magneto as well. Assuming that the chain has been removed and the motor must be retimed: The first step is to obtain a starting point, a mark from which to work. By referring to Fig. 1 it will be seen that a line has been scribed on the housing, and this timing mark



without touching sufficiently to separate the contact points. Remove the breaker box cover occasionally and clean the components, but do not use

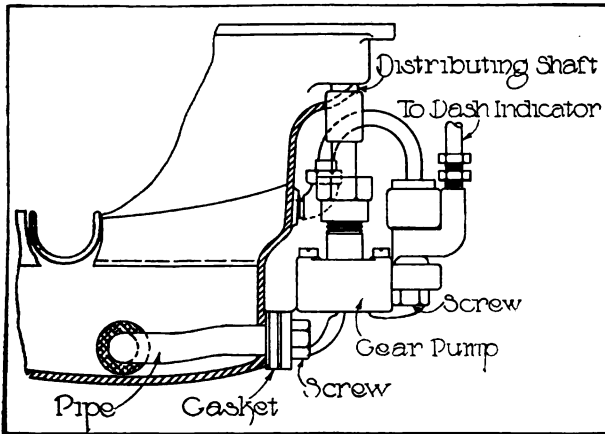


Fig. 2—Showing the Location of Premier Oil Pump and Parts Displaced to Clean the Filter.

any lubricant whatsoever on the mechanism.

### TIMING K-R-I-T MOTORS.

There are two methods commonly employed in timing motors, one by the piston travel, the other marking of the degrees on the flywheel. Where very accurate work is desired, allowance must be made with old cars for the wear of the gears, lost motion in the main and connecting rod bearings, wristpins and other parts.

Owners of K-R-I-T motor cars will find the timing diagram presented at Fig. 3 of service in the overhaul of the power plant and when checking up the valve timing. With this design, irrespective of the model, the travel of the piston and its location are utilized. As will be seen from the drawing the stroke or piston travel is four inches, and that in the sketches A, B, C and D, top and bottom centres, are denoted by a horizontal line. These indicate the position of the piston at the time of the opening and closing of the valves. During the four strokes of the cycle the crankshaft makes two complete revolutions. The camshaft makes one revolution to two of the crankshaft.

To time the K-R-I-T motor the piston of the first cylinder, that nearest the radiator, is brought to the top and the flywheel rotated until the pis-

ton descends .046875 inch. This corresponds to 12 degrees on the flywheel as shown at A. With the piston in this position the cam should just begin to lift the valve tappet. The inlet valve should close when the piston has completed the second (intake) stroke and has started upward on the compression stroke a distance of .171875 inch or 28 degrees past lower dead centre as indicated at B.

The exhaust valve opens .328125 inch before lower dead centre or 39 degrees before the piston completes the down stroke as shown at C, and closes practically at top dead centre or two degrees after the piston attains this position, as shown at D. If it is borne in mind that half a revolution means a complete stroke of the piston and four strokes are made to a cycle, the work of timing will be greatly simplified.

The tappet clearance should be approximately .029 inch and with adjustable members this can be obtained. With solid tappets, the valve stem will have to be lengthened by drawing the temper, an operation best performed by one familiar with the work. Before retempering the ends of the stems it is advisable to place them in the cylinders to make sure the distance is correct. To prevent error in replacing the valves the heads can be prick punched, beginning with the exhaust of the first cylinder, marking this with one dot and the balance in order. Novices are apt to mix the valves in work of this kind. Although the diagram shows the lift of the inlet valve to be

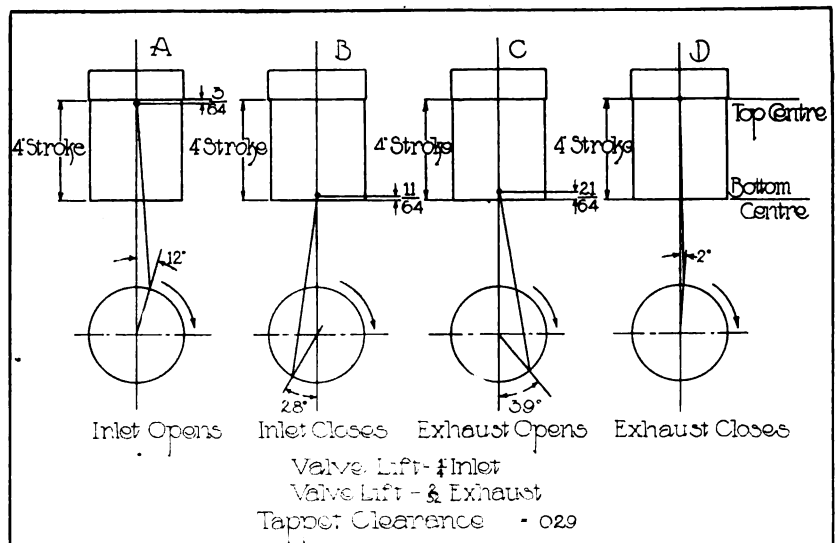


Fig. 3—Timing Diagram of K-R-I-T Motors, Also Outlining Position of Piston During Opening and Closing of Valves.

.25 inch, and that of the exhaust .06245, unless one be familiar with fine measuring tools and their use, observe the above instructions.



### CLEANING PREMIER OIL FILTER.

With the series X Premier motors the lubricant is circulated by a gear pump and a dash sight feed indicates the operation of the system, the oil running in a steady stream through this member. Failure is generally caused by a lack of oil or because of the presence of sediment in the filter.

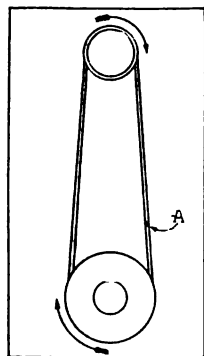


Fig. 4—Ford Fan Belt.

The filter should be examined and it may be inspected by displacing the screws retaining the old manifold to the pump as shown in Fig. 2; also those holding the pump to the crankcase. This will permit of drawing the pump downward and disengaging it from the distributor shaft. Next, remove the oil pump suction pipe from the crankcase and clean it thoroughly with a brush dipped in gasoline. In displacing the pipe be careful not to injure the gasket as this member preserves the alignment of the pump with the distributor shaft.

### FORD FAN BELTS.

In fitting new fan belts to the model T Ford cars it is important that they be installed so that the smooth side is on the pulleys and that the inside end of the belt rides with the pulley as shown at A, Fig. 4. The belt is a one-piece construction, and in sewing the ends in making they overlap slightly at the point A. Water should not be allowed to drip from the cooling system on the belt as it augments stretching and cracking of the material.

### ADJUSTING REGAL STEERING GEARS.

Backlash or lost motion in the steering mechanism is undesirable and should be eliminated, but in adjusting the parts it should be remembered that tightness should be avoided. The careful motorist inspects his steering gear from time to time, tightening up any loose nuts or bolts, cleaning the parts and renewing the supply of lubricant. Much of the play in steering gears is due to lack of attention.

The steering gear utilized on models N and T of the Regal car is of the worm and gear type and is adjustable for end play of the steering column and for wear of the worm and gear. The components utilized in eliminating lost motion

are lettered at Fig. 5 and it will be noted that a notched nut is fitted at the end of the steering post. This is employed to reduce end thrust of the column and adjustment is obtained by removing the dowel screw and turning the nut to the right, which movement tightens the bearing. To test the movement it is best to jack up both front wheels, preventing stresses to the steering gear and linkage, which would otherwise ensue with the wheels on the floor.

If it is found there is lost motion or too much backlash between the worm and gear it may be reduced by turning the bushing where the ball arm shaft enters the gearcase. As rotating this bushing raises or lowers the steering post, the bearing supporting the end of the shaft should be loosened from the frame and enough to allow replacing or removing shims between the bearing and the frame, also to prevent cramping of the shaft in the bearing.

If adjustment of the bushing fails to correct lost motion, the ball arm shaft will have to be removed and turned through an angle of 180 degrees, which will bring an unworn section of the gear into mesh with the worm. Before attempting this work the ball arm should be removed, which is accomplished by loosening a nut and bolt, also disconnecting the draglink. Before replacing the arm it will be necessary to file a notch through the upper corner of the squared section of the shaft, diametrically opposite from the original notch, so as to permit the bolt, which retains the assembly, to be replaced. All nuts, bolts, etc., should be gone over carefully to make sure they are tight and after operating the car for a

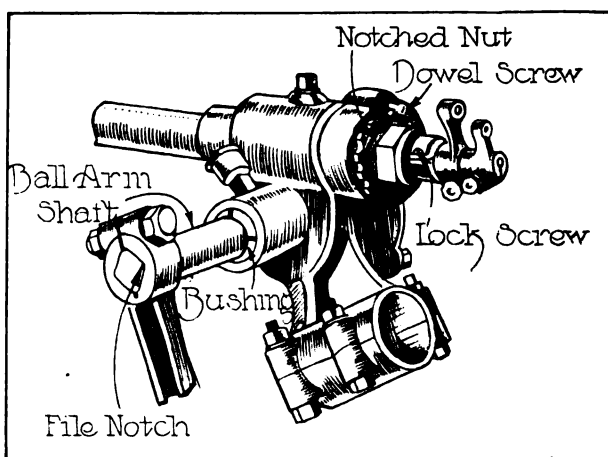


Fig. 5—Components Utilized in Eliminating Lost Motion in Steering Gear of Regal Cars.

few miles the parts should again be examined, as it will generally be found that they can be taken up slightly.



## IN THE COMMERCIAL VEHICLE FIELD.

### Testing New Carburetor Designed for Kerosene and Similar Fuels---Brief Details of Van Auken Electric and G. V. Mercedes Gasoline Machines.

**I**N CONNECTION with the search for a substitute fuel for gasoline, a test of "oil toppings", a refinery product which has heretofore been regarded as practically worthless, was made recently on the Pacific Coast, the carburetor utilized being of special design and an invention of Harry Miller of that city. O. W. Kern drove a 1500-pound KisselKar delivery wagon from Los Angeles to San Francisco, a distance of some 472 miles, in 24:40:00. The machine was loaded with 2000 pounds of goods, and the test was looked upon as a success in every way.

It may be stated that the carburetor in question was designed particularly to handle kerosene and other similar fuels. Aside from the experiment with oil toppings, which is rated at three cents a gallon on the Pacific Coast, other successful trials have been made with kerosene, a mixture of kerosene and distillate, distillate alone and equal parts of distillate and gasoline. The total fuel expense for the Los Angeles-San Francisco trip was \$1.40, and the consumption was one gallon to each 10.15 miles.

In this connection, it also is of interest to note that the Owen H. Fay Livery Company, Chicago, has made contract for the equipment of 50 of its machines in general passenger service in that city, with Coleman gas producers.

#### SAVES 16 CENTS A TON.

#### City of New Bedford Finds White Truck an Economical Proposition.

Officials of the street department in New Bedford, Mass., purchased a three-ton White dump-

ing truck through the local agent, the Auto Supply & Selling Company, last June. The machine is utilized in hauling road materials, and the dumping mechanism is so arranged that it is operated by the power of the motor, thus making it possible for one man to do all the work.

Superintendent C. F. Lawton reports that the truck has fulfilled all expectations in the matter of reducing the department's hauling charges. On the first job, where it was used in transporting cracked stone, the cost a ton was reduced from 21 cents to five. Since that time, and in similar work, the machine has shown a transportation cost of less than four cents a ton. Mr. Law-



White Three-Ton Dumper in Service with Street Department in New Bedford, Mass.

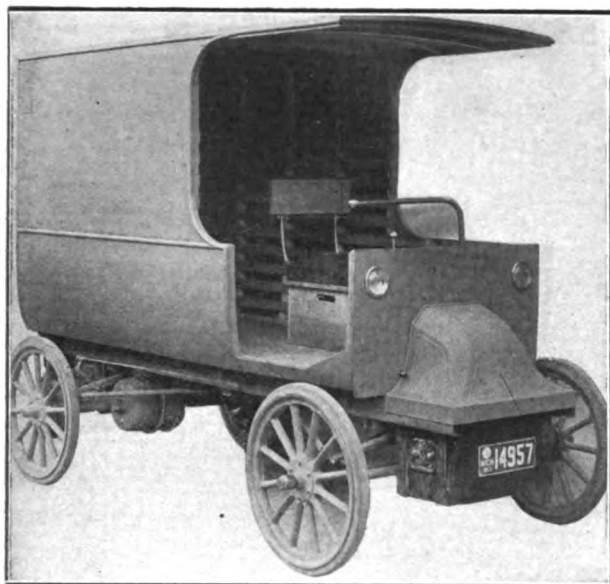
ton explains that these savings have been made on hauls of moderate length, and that they would have been somewhat larger on long hauls. "We find the truck is available for quite a variety of jobs and has proved its economy wherever used", he says.

#### VAN AUKEN ELECTRIC.

#### New Type of Light Delivery Wagon to Be Produced in Connersville, Ind.

The Van Auken Electric Car Company, Connersville, Ind., is producing a new type of electric delivery wagon with rated capacity of 750





**New Van Auken 750-Pound Electric Delivery Wagon.**

pounds. The designer is Charles M. Van Auken, who was for some time engaged in special work for the Ford Motor Company, Detroit. He is president of the concern, and the other officers are: Vice president and treasurer, Guilford C. Babcock; secretary, Clarence L. Millard, formerly of the Connersville Carriage Company, and chief engineer, O. C. Thompson.

The new wagon is extremely simple in design. The chassis is a steel channel section with strong end and cross frame members, mounted on two cross springs that are arched above and parallel to the axles, the springs being shackled at each end. From the centre of the middle cross frame member radius rods diverge and connect with the axles at the points where the spring shackles are located.

Back of the middle cross frame member is another cross member from which the motor is suspended transversely in the chassis. On the driving end of the armature shaft is a pinion that meshes with a reduction gear mounted on the motor case, and the latter gear meshes with a gear wheel mounted on the end of the

driving shaft. At the other end of the shaft is a second gear meshing with the crown gear of the differential set. The rear axle is a live type with a triangular housing and the forward axle is tubular.

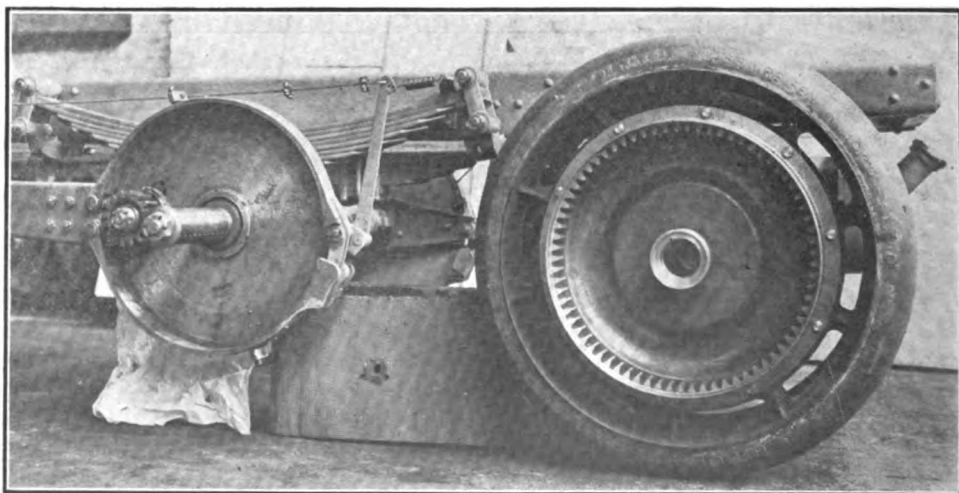
The steering gear is a conventional linkage operated by a tiller, and the brake is a set of shoes expanding in drums on the rear wheels, actuated by a pedal. The battery is divided and is underslung, a crate carrying eight cells being suspended at either end of the chassis frame. The arrangement of the terminals is such that no mistake can be made in connecting the battery. The resistance is beneath the centre of the body. The controller is a rotary type and is carried beneath the driver's seat, being operated by a short lever at the left side.

The wheelbase is 80 inches and the tread 51. The length of the chassis from the dash to the rear end is 90 inches. Back of the seat the loading space is 56 inches, but it will be noted from the accompanying illustration that the seat is so placed that a portion of the body in front may be utilized for loading. It is maintained that with a battery of 16 cells it is possible to cover from 40 to 50 miles on a charge, and as the exchange of battery is made easily this may be doubled without difficulty.

### **G. V. MERCEDES TRUCK.**

**General Vehicle Company Is Prepared to Produce Six-Ton Model Commercially.**

Announcement has been made by the General Vehicle Company, Long Island City, N. Y., that it is now prepared to produce commer-



**Internal Gear and Driving Pinion, and the Axle Spindle on G. V. Mercedes Truck.**



cially the G. V. Mercedes truck. Early in 1912 this concern, which has heretofore been engaged solely in the manufacture of electrics, acquired the American rights for the production of machines under the Mercedes patents. The present announcement was withheld until the completion of the new plant, work on which has been under way for about a year.

Only one model will be produced at present. This will practically be in duplicate of the machines built in the German factory, and will be rated at six tons. Two sizes of motor will be offered, and either will be installed to meet the requirements of the purchaser. For conditions where the need of power is extreme an engine rated at 45 horsepower will be utilized, and where the demand for power is not so great, a 35 horsepower engine will be recommended.

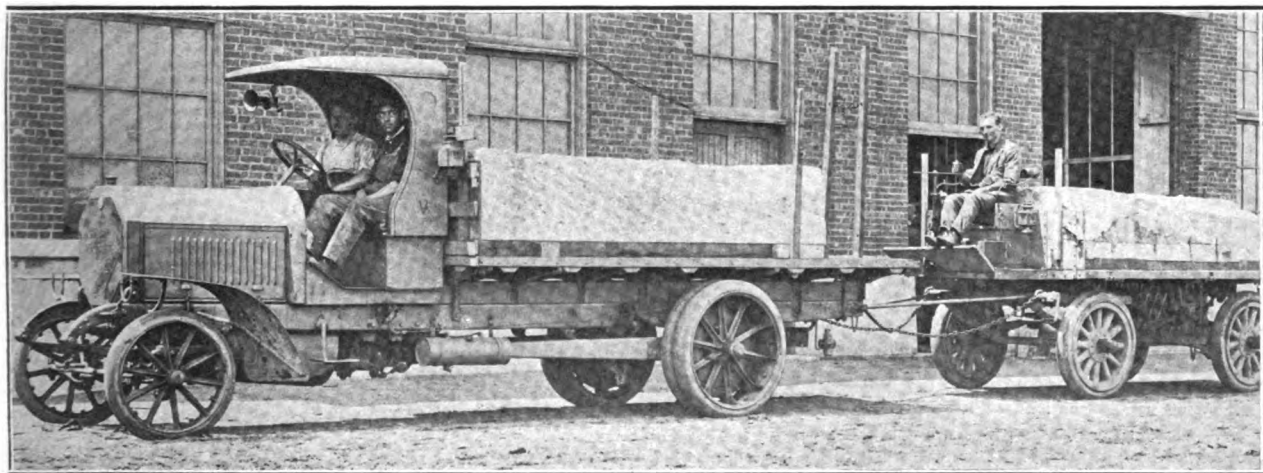
The former power plant has a bore of 4.74

forgings. The wheels are of steel, the forward set being shod with 34 by five-inch single band tires, and the rear with 40 by six-inch dual band tires. The wheelbase is 169.25 inches and the tread 60.625 inches. The driver is placed at the right, with control at the right. Two sets of brakes are fitted, one on the main driving shaft and the other on the rear wheels.

### REDUCES TIRE PRICES.

#### Importer of Gaulois Product Does Not Absorb Tariff Difference at the Wharf.

During the discussion attendant upon the passage of the new tariff bill, certain members of Congress maintained that the difference in rates would be absorbed by the importer at the wharf, and that the public would benefit very



**Six-Ton G. V. Mercedes Gasoline Truck and Trailer, Both Loaded, Showing the Capacity of Machine for Haulage.**

inches and stroke of 6.29, while the latter has bore of 4.25 inches and stroke of 5.9. Both are identical save for the part dimensions. They are of the four-cycle, four-cylinder, water-cooled, L head type, with cylinders cast in pairs. Lubrication is by a combination of force feed and splash. Water is circulated by centrifugal pump. Ignition is by high-tension magneto.

The clutch is a cone of large size. The transmission is selective, giving four speeds forward and reverse. The forward ratios are 1.08, 4.09, 6.98 and 10.82 miles an hour. The complete reduction of the driving system is 14:1, of which 4.5:1 is between the pinions at the ends of the jackshaft and the internal gears on the rear wheels.

The frame is a pressed steel channel section, 21 feet five inches long, mounted on semi-elliptic springs. The front and rear axles are heavy steel

little as a result. The Gaulois Tire Corporation, 49 West 64th street, New York City, calls attention to this in making announcement of a reduction in price to meet the difference between the old duty of 35 per cent. to the new of 10 on tires.

The Gaulois Tire Corporation, which imports the Gaulois tire from France, has been operating in this country only since February, although the manufacturer has been producing this make of tires for the past 17 years. It is maintained that the high quality of the product has commanded a higher price than for most tires sold in competition therewith, but the new tariff rate is held to have removed this disparity, and the importer foresees a large increase in orders in consequence.

F. R. Robinson has been appointed comptroller of the Packard Motor Car Company, Detroit.





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Postoffice at Pawtucket, R. I., under the Act of Con-  
gress of March 3rd, 1879.**NATIONAL HIGHWAY FUNDS.**

Two splendid organizations have been formed with the definite object of securing national funds for improved road construction and maintenance. One asks that Congress authorize the appointment of a special commission, composed of engineers and others qualified to give the matter careful study, which shall "investigate, collect information and report to Congress on the highways of the United States, together with recommendations as to the proper policy of the national government in respect thereto, whether by the establishment of a system of national highways or by federal aid or otherwise." The other asks Congress to authorize the appointment of a commission from civil

life "to make a thorough and exhaustive report on, and to recommend a system of federal aid."

Perhaps the use of the term federal aid in the latter instance has a broader meaning than when generally employed in connection with highway matters. Bearing in mind, however, the position which has been held heretofore by this association, it would appear to limit the activities of the proposed commission to a consideration of but one phase of the subject, whereas the bill prepared by the other organization expressly states that the recommendation as to method shall be left for the commission to determine.

It is somewhat unfortunate that the large body of citizens represented by these two national organizations have not as yet been able to agree upon the plan for securing what they, and the public generally, believe desirable. Individuals may differ as to the proper distribution of federal funds for the construction and maintenance of highways, but it is obvious that, if early success is expected, some effort must be made to secure concerted action.

**UNIFORM MOTORING LAWS.**

While in itself it does not solve all the problems which confront the touring motorist by reason of the conflicting provisions of the motoring laws in the several states, the Adamson bill, now in Congress, goes a long way toward securing that object. If automobile owners may visit any state in the Union without danger of being called upon to take out additional registration papers, then interstate touring is to receive an impetus which will mean much to the nation as a whole. The other discrepancies between the various statutes may reasonably be expected to right themselves much sooner than otherwise would be the case.

The American Automobile Association believes there is a splendid chance for this bill to be enacted by Congress. Certainly, it would appear that it was devoid of some of the features which are thought to have defeated previous attempts at similar legislation. It remains for motorists to do their part in convincing their representatives in Congress that such action is desirable.

The duty of the Pennsylvania citizen is clear. Vote "Yes" on the constitutional amendment permitting bonds for road improvement.



## PATHFINDER FEATURES NEW BODY LINES.

WITH the exception of utilizing lighter pistons and connecting rods, which is said to result in increasing the efficiency of the motor 20 per cent., and minor refinements, the 1914 Pathfinder line, made by the Motor Car Manufacturing Company, Indianapolis, Ind., is mechanically the same as last season. The same models are continued, these comprising: Five-passenger touring car, two-passenger roadster, two-passenger cruiser and Martha Washington coach. All models are fully equipped, including a Gray & Davis electric lighting and motor starting system and oversize Kelly-Springfield 35 by 4.5-inch tires.

The improvements have been made about the body and accessories, the instrument board, for instance, being brought nearer the driver and a one-piece adjustable windshield adopted. The mohair top has been replaced by a leather construction having the straps concealed between the bows, while a patent strapping device retains the bows in a rigid position, preventing wrinkling of the leather. A bumper has been added to the standard equipment, the running boards stripped clean, and the battery suspended on the frame. The chief changes in body detail are alterations in the lines, these obtaining a streamline effect, and the shape of the fenders has been altered, be-

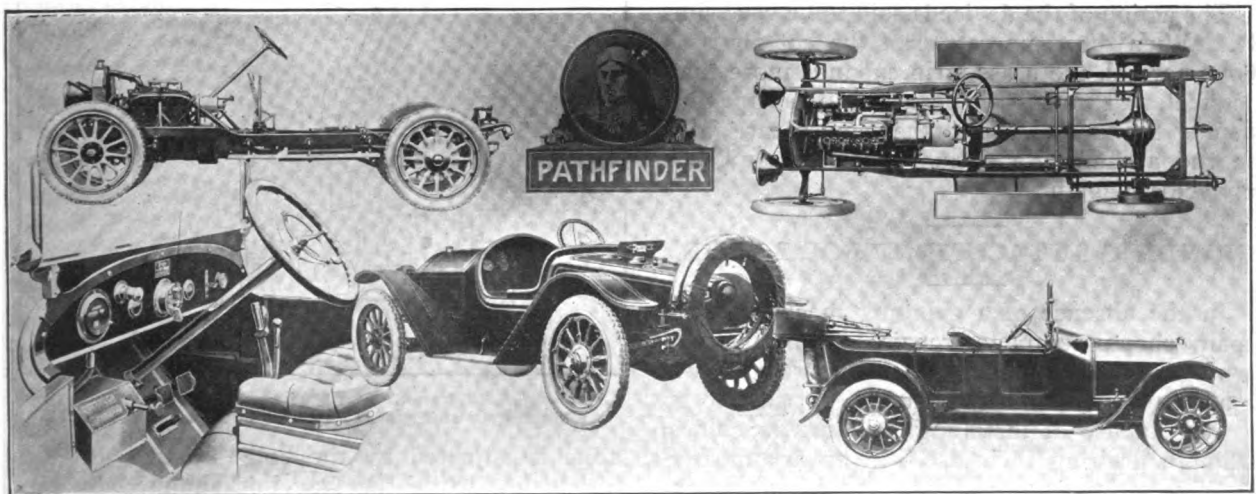
ing more sweeping than formerly and free from ridges, etc. A new feature of the upholstery of the Pathfinder models is the utilization of a double spring construction in the cushions, the spring being divided in the centre, the top section having a slight tension, designed to make for easy riding over rough roads.

The L head type of motor is continued, a block casting, also the double lubricating system, two plunger pumps being located in the lower half of the crankcase. These pumps are operated by eccentrics. A unit power plant, clutch and transmission is employed, the clutch being a cone with spring inserts. The gearset is of the conventional selective type, providing three forward speeds and a reverse with vanadium chrome steel and Rhineland bearings.

Drive is by shaft enclosed in a torsion tube. A floating type of rear axle is utilized and provision is made for inspection and adjustment of the pinion and bevel gear, also of the differential. The brakes are of the internal expanding type, liberal in size and easily accessible for adjustment. The driver is placed at the right with right hand control. One of the features of the line is the design of the wheels, the felloe being so shaped as to give a colonial effect, and it is termed the Chariot wheel by the maker.

### DETAILS OF 1914 PATHFINDER LINE.

**Double Spring Upholstery.**  
**Double Lubricating System.**  
**Combination Dash and Trouble Lamp.**  
**Electric Lighting and Motor Starting.**  
**Bumper Added to Standard Equipment.**  
**Instrument Board Placed Nearer Driver.**  
**Optional Location of Tail Light on Cruiser Model.**  
**Leather Top Instead of Mohair with Straps Concealed Between Bows.**  
**Four-Cylinder, L Head, Block Type Motor Continued with Pistons and Connecting Rods Lightened.**  
**Body Styles Comprise Five-Passenger Touring, Two-Passenger Roadster, Two-Passenger Cruiser and Martha Washington Coach.**



Illustrating Some of the Details of the 1914 Pathfinder Line, Including Four Body Designs.



## THE REPAIR SHOP AND THE GARAGE.

### Grinding Attachment Which May Be Fitted to Any Lathe of Sufficient Centre Capacity---Thermostat Couple for Controlling Hot Air to Carburetor.

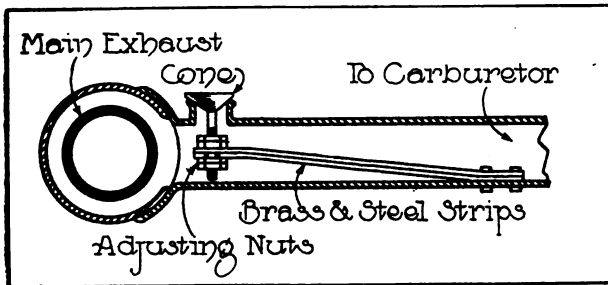
**T**HE benefits accruing from the use of heated and auxiliary air in carburetion are well known. When auxiliary air is admitted to the

tached to any engine lathe of sufficient centre capacity.

The grinder itself is carried by a slab and studshaft, the arm of which is about 1.75 inches in diameter, so as to insure the necessary rigidity. The slab is attached to the face plate of the lathe by means of two .75-inch bolts, of which the top one is arranged in a radial slot, to facilitate adjustment of the work in hand. Upon the arm of the studshaft is mounted a length of solid drawn hydraulic tubing, which revolves on two brass bushings forced and sweated into the ends of it, thus leaving an annular space for the lubricant.

The tube carries a driving pulley on its inner end, the grinding stone being attached to the outer end. The driving pulley is secured to the tube by means of two set screws. This pulley is fitted with a sufficiently convex face, in order to eliminate lateral slip of the belt. The outer end of the tube is threaded to receive a thimble, which is screwed and sweated into place.

Owing to the concentric path which the grinding stone spindle follows, the use of a floating countershaft is necessary. The connecting rod to the latter is shown broken off in the lower illustration, and the arrangement of the floating countershaft is depicted in the upper drawing. As previously mentioned the feed of the grinding



Automatic Control of Air Admitted to Carburetor Operating on the Thermostat Principle.

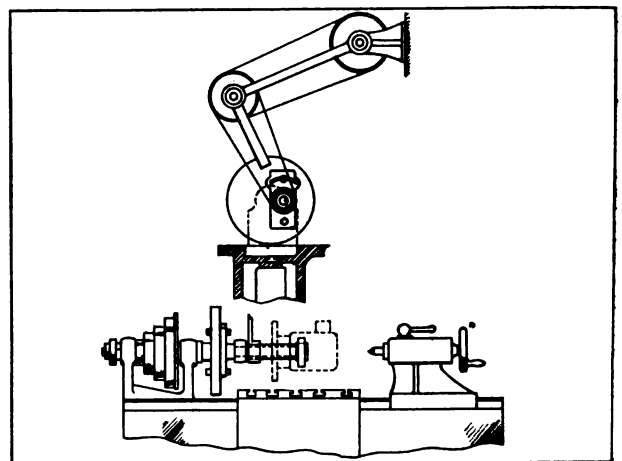
intake pipe the control is manual. An automatic device, which presents interesting features, is noted in a current number of the Commercial Motor, an English publication, and an accompanying drawing presents its construction.

The thermostat, or couple, is constructed out of strips of steel and brass, each approximately six inches long by .125 inch thick and .5 inch wide. They are sweated together throughout their length and so bent that when one end is riveted to the inside of the pipe the other end stands midway in the pipe diameter. The brass strip is fitted on the under side. The valve is constructed of aluminum, and is provided with a threaded stem over which are screwed four lock nuts, these serving to adjust the valve.

The action of the device is said to be very simple. When the temperature of the hot air rises above normal, the brass strip expands more than the steel, and causes the couple to bend up, thus opening the valve. When the temperature falls, the rod assumes its normal position and the valve closes again.

### GRINDING ATTACHMENT FOR LATHE.

In the absence of a grinding machine many repair shops complete repairs by boring and turning, when a fine degree of accuracy would be advisable. Many repairmen do not care to go to the expense of installing grinding machines, although desiring their use. In an accompanying illustration is presented a grinding attachment, the designer of which states may be at-



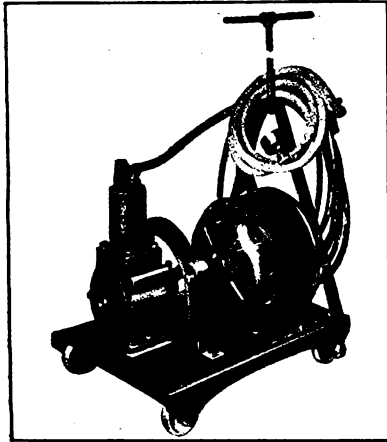
Grinding Attachment for Lathe—Arrangement of the Floating Countershaft Is Shown in the Top View.

stone is adjusted by the bolt situated in the radial slot, while the travel is supplied by the lathe slide rest.



## GARAGE AND REPAIR SHOP EQUIPMENT.

**T**IRE inflators operated by electricity appeal to the motorist in that considerable labor is saved. The progressive garage proprietor and



Ten Eyck Pump Outfit.

manager of the service station installs electrical equipment to provide his customers efficient service, and there is a wide variety of apparatus manufactured to meet requirements. The portable type has many advantages, in that it may be wheeled to a car

in proximity to a lighting connection, and this saves moving the machine.

The Ten Eyck Pump Company, 10 Garden street, Auburn, N. Y., is marketing the compact, moderately priced equipment shown in an accompanying illustration, which is simple in design and sturdily constructed. It comprises a Ten Eyck model D pump, which is gear driven from a .25 horsepower Century electric motor, and both units are mounted on an iron table with wheels, so that the outfit can be moved easily as desired. The handle is so attached that it can be placed upright, minimizing space.

Included in each equipment are six feet of high grade rubber tubing, a pressure gauge and tire connections, 15 feet of best extension cord and a plug for attachment to any ordinary lamp socket. A fuse box is incorporated to prevent overload of the motor.

The entire outfit is 11 by 14 inches and weighs but 50 pounds. In the standard equipment made by the company, a .25 horsepower Century Invincible-Type, 60-cycle, single-phase, 110-volt alternating motor is fitted. The maker is prepared to install a 220-volt alternating, or 220-volt direct current motor at a slight additional cost. The standard outfit is suitable for either tire or tank service and for any pressure not exceeding 130 pounds.

The model D pump employed has a bore of 1.75 inches and stroke of 2.25, and the cylinder, piston and rings are ground accurately to size. The crankshaft is a drop forging, the connecting

rod of bronze and the bearings are of similar material. The valve is a steel ball on a bronze seat and the intake is through port holes. The company will supply complete data and prices on request.

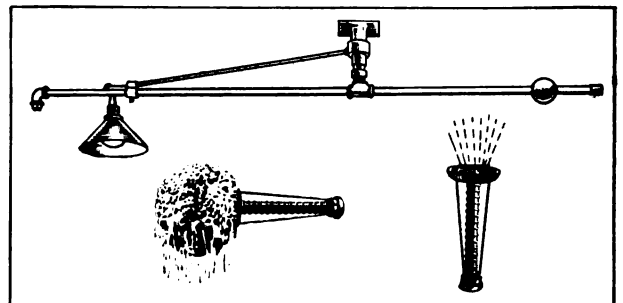
### CARVER ELECTRIC GRINDER.

The American Electric Tool Company, West Newton, Mass., maker of Carver portable electric tools, is manufacturing a grinder operated by electricity constructed in three types, each of which may be moved around the shop if desired, although heavy enough to permit of their operation without being secured. The base is very substantial and a special feature, to which the maker calls attention, is the casting of the water pot in the base. The last named part is sufficiently wide to prevent tipping when the work of grinding is started.

Types A. G. B. L and G. B. 1 carry a grinding wheel six by .375 and .5 inch respectively and turn at 3500 revolutions a minute. The first named model is employed with an alternating current; the G. B. 1 and G. B. 2 with direct. The last named employs a .75-inch wheel, eight inches in diameter, and runs at 2500 revolutions a minute. It also is provided with two wheels, one at either end, and two tool rests and wheel guards. The company issues a catalogue illustrating and describing its equipment, which is mailed free on request.

### IDEAL OVERHEAD WASH FOUNT.

The Gaylord Sanitary Manufacturing Company, Rochester, N. Y., is marketing the Ideal overhead wash fount shown in an accompanying



Ideal Overhead Wash Fount, Having Electric Light and Counterbalance Weight to Relieve Arm of Strain.

illustration, and many practical features are claimed for the construction. All parts are sturdily constructed and as will be noted the arm is

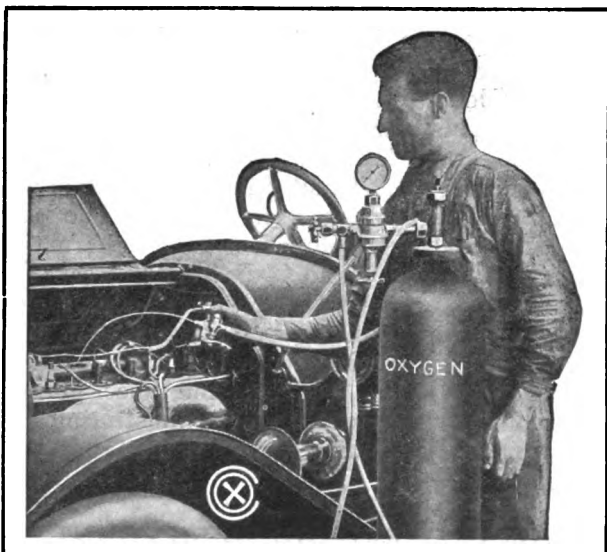


provided with a counterbalance weight which relieves all strain when the arm is being rotated and the equipment is being used. The washer comes with or without the electric lamp, which is a 32 candlepower member, fitted with a shade to project the light upon the work.

The washer proper may be employed without a sponge if desired, the device being shown with the sponge attached and without it. The sponge supplied is the best quality Rock Island sheep wool, and the maker states that its texture is such that it will not scratch the finest finish.

### COX OXYGEN CLEANER.

During the past 12 months many devices have appeared which effect a considerable saving of time and labor for the garage, repair shop and



The Oxygen Carbon Cleaner Equipment, Marketed by the Cox Brass Manufacturing Company, and Method of Use.

service station, and the motorist is directly benefitted in that the cost of maintenance is reduced. Formerly an owner was deprived of the service of his car for a considerably longer period than is required to accomplish the same work at present. Many of the improved methods save the owner a great deal more than the difference in the cost of labor, for attention is now paid to those details which make for economy of upkeep.

It is a well known fact that many motorists delay having the carbon removed from the cylinders because of the expense involved, also because it means the loss of the service of the machine, as generally the cylinders have to be removed, to say nothing of the fittings, etc. With some types of motors this takes considerable time and often the repairman experiences trouble

with old motors in obtaining tight connections.

The introduction of the oxygen process has eliminated the tearing down of motors and not only does it accomplish the work more thoroughly, but in considerably less time. It is pointed out by the maker of the equipment that a four-cylinder engine can be cleaned in 30 minutes and a six-cylinder in 45. One of the advantages of the method is that deposits are removed from crevices, etc., not accessible with the scraper.

The Cox Brass Manufacturing Company, Albany, N. Y., is marketing the Cox oxygen carbon cleaner, which equipment is shown in an accompanying illustration. It comprises a tank of oxygen with pressure gauge, etc., and a flexible arm which is inserted through the spark plug opening of the cylinder. Means for controlling the flow of the mixture are provided, as shown in the illustration, and the oxygen consumes the carbon without affecting the metal. It is pointed out by the maker that a large number of motors may be cleaned during a week and that the cost of labor and maintenance of the equipment is slight.

The equipment is constructed of high grade material, and high class workmanship characterizes all the products of this company, and each outfit is tested carefully before being shipped from the factory. The oxygen tanks are loaned, the only charge made being for the refill. The Cox oxygen carbon cleaner equipment is moderately priced and the maker has an interesting proposition for the trade.

### NEW SMITH BODY FITTINGS.

Joseph N. Smith & Co., Detroit, is placing on the market three new specialties. One comprises a dove tail bumper for bodies, designed to take up on the cushion principle all looseness of the door, as well as to prevent rattling. Another is a sashless glass channel molding designed for use with sashless glass with closed types of bodies. The company also is making a new lever lock.

### MOVABLE LIGHT STAND.

The Muller Manufacturing Company, East New Durham, N. J., has brought out a new light stand which is mounted on casters, permitting its use about the garage. A cluster of four bulbs is employed with a suitable reflector and the latter is adjustable. Sufficient length of lamp cord and a socket are supplied with each equipment, which is moderately priced.



## WITH THE CYCLECAR MANUFACTURERS.

**Maker of Carnation Changes Name to Voiturette--Details of Fenton, De Cross and Los Angeles Models--Another New Company Is Formed.**

**H**ISTORY must repeat itself—at least, in a measure. Whether or not the industry shall eventually term the new type of vehicle a cyclecar or a small car, its development cannot help but be somewhat in the nature of a repetition of that which produced the practical automobile. Those who have engaged in this work—and their number has increased very rapidly during the past few months—find the market eager and expectant. Perhaps it is not too much to suggest that the general public is impatient.

The practicability of the automobile has long been an accepted fact. Many people feel that in the new type of vehicle they will find a machine capable of accomplishing much the same work as the regulation automobile, but at less first cost and with a corresponding reduction in the expense of upkeep and maintenance. The manufacturers have undertaken to meet these requirements.

Of course, designers have the benefit of past experimentation. While it may be a simple matter to incorporate engineering principles which have been indorsed by sound automobile practise, it must be remembered that the desired objective is a machine which can be produced not only to sell for less money, but to present an operation expense that shows an appreciable reduction. These two factors must determine the design that is finally decided upon by the manufacturer.

The task is by no means so simple as it would appear upon first thought. In fact, this is just the result toward which the automobile manufacturer has been working for some time. The new type of vehicle merely aims to accomplish a larger reduction than can reasonably be hoped for with the modern automobile, and this can be achieved only along practically new lines of endeavor.

Designers of cyclecars, or of the new small cars, believe they will be able to secure the desired results by a different application of principles which already have been accepted by automobile engineers. Subsequent tests on the road and in the factory must determine the actual ef-

ficiency of the application—always with the two important factors in mind. This may mean that minor changes will be found necessary.

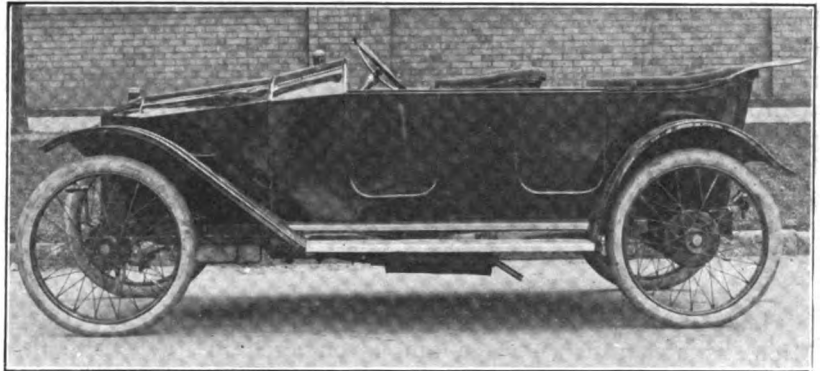
After all, the public can best be served by the manufacturer who makes every effort to determine the practicability and efficiency of his product before placing it on the market. Some cyclecar producers already have made the necessary road tests, and feel able to present more or less complete mechanical details for public consideration. Others are still engaged upon the experimental work.

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### VOITURETTE SMALL CAR.

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It will be noted that even among manufacturers there is a wide difference of opinion as to the

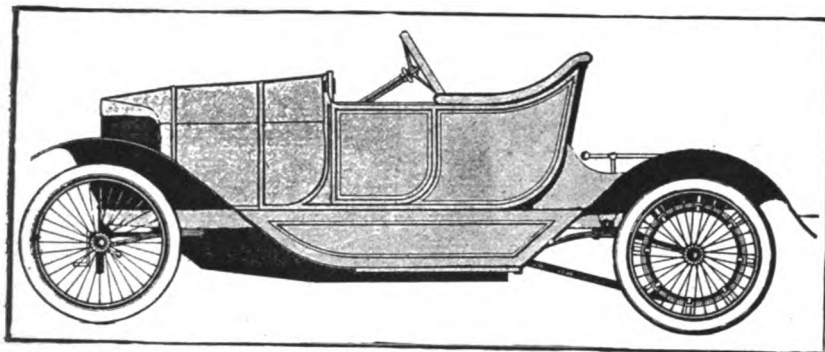


**Voiturette Touring Model Is Now Listed in Small Car Class.**

proper name to be applied to their product. The American Voiturette Company, Detroit, Mich., was among the first concerns in this country to announce the production of a cyclecar, which was christened the Carnation. The original machine was a two-passenger roadster, with seats side by side, and it was forecasted that the line eventually would be increased by the addition of a tandem two-seater and a four-passenger touring model. These last two have now been added, but the name of the entire line has been changed to the Voiturette small car.

The chassis is the same with each. The motor is a four-cylinder, L head unit, cast en bloc, with bore of 3.375 inches and stroke of 3.75. Lubrication is by pump. Cooling is by water, ther-





**Fenton Roadster Type, with Luggage Compartment at the Rear.**

mo-syphon system, with V type radiator. Ignition is by Splittorf high-tension magneto. The motor, multiple disc clutch and three-speed transmission form a unit power plant. Drive is by shaft to a semi-floating rear axle, fitted with Hyatt bearings throughout. Brakes are double expanding on the rear wheels. Springs are of the cantilever type. The tires are 30 by three inches, fitted to detachable wire wheels.

In making public the specifications of the various models, the company makes no reference to any difference in seat width, although it might be expected that there was a difference between the tandem two-seater and the touring car. The roadster and touring car have seats 39 inches width. The wheelbase of each is 100 inches and the tread 44. The equipment includes oil lamps, bulb horn, jack, pump and complete set of tools. A top is fitted on the touring car.

#### FENTON CYCLECAR.

The Fenton Cyclecar Company, Fenton, Mich., is being incorporated and is engaged in the preliminary work of producing a new cyclecar which is to be known as the Fenton. So far as the plans have been made public, it would appear that the machine was to be a two-passenger roadster type, the seats being placed side by side, with a platform at the rear for luggage. The streamline effect is carried throughout, terminating with the pointed radiator.

The motor is a De Luxe special, air cooled, rated at 9-13 horsepower. The car utilizes a friction transmission and drive to the rear wheels is by V belts of imported rubber. The slippage of these belts is expected to take care of any difference in the rotative speed of wheels in rounding corners, etc., so that no

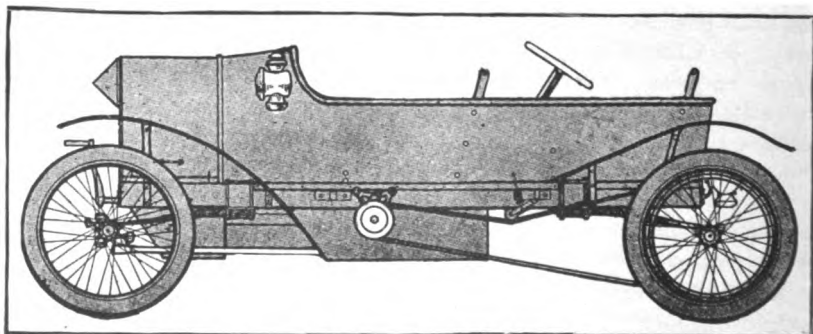
differential of any type is to be fitted, according to the present plans.

The forward springs are semi-elliptic, fastening to the frame at their ends, while the rear members are full elliptic, so arranged as to give a double cantilever action. The wheelbase is 96 inches, and the tread 36. The overall width outside the fenders is 45 inches and that of the seat 38 inches. The weight is 500 pounds. The equipment will include electric lights, supplied by a storage battery.

#### DE CROSS CY CAR.

The De Cross Cy Car Company, Cincinnati, O., brings to view an entirely new feature in American cyclecar design, by placing the driver at the rear of its two-passenger tandem De Cross Cy Car. The general effect appears to be somewhat in the nature of a combination of the British and French designs, with the latter rather more prominent. That is to say, the seating arrangement and the placing of the fuel tank over the motor follow Continental practise, while the spring suspension—quarter-elliptic springs fastened at either end of an ash frame—is very much like that utilized on several English cyclecars.

The company has been unable to make public all the details of construction as yet. The present plans are to utilize a two-cylinder V motor rated at 10-12 horsepower, friction transmission, and flat belt drive. By the accompanying sketch it will be noted that jockey pulleys are utilized for tightening the belts. The wheelbase is 98 inches, and the tread 36. The ground clearance is 10 inches. The drawing presented is that of the experimental machine and several changes may be made in the completed design.



**De Cross Cy Car, with Driver Located in the Rear Tandem Seat.**



### LOS ANGELES CYCLECAR.

L. E. French, who designed the California cyclecar, announced earlier in the year, has transferred his patent rights to a new company, the Los Angeles Cycle Car Company, incorporated for \$150,000 under the laws of Arizona. This concern is located at 612 South Olive street, Los Angeles, Cal., and has secured a factory site comprising 16 acres a short distance outside the city. Mr. French is president and general manager, and plans are said to be perfected for the production of 250 cars a month.

The Los Angeles cyclecar differs somewhat, at least in general appearance, from the machine first produced by Mr. French under the name of the California cyclecar, although the mechanical features are essentially the same. Two models are to be manufactured, one being fitted with a two-cylinder 10 horsepower motor and the other with a four-cylinder power plant rated at 12-15 horsepower. Both are designed to carry two passengers, side by side. The wheelbase with each is 102 inches and the tread, 44. The weight of the smaller car is about 450 pounds, and of the larger, 500.

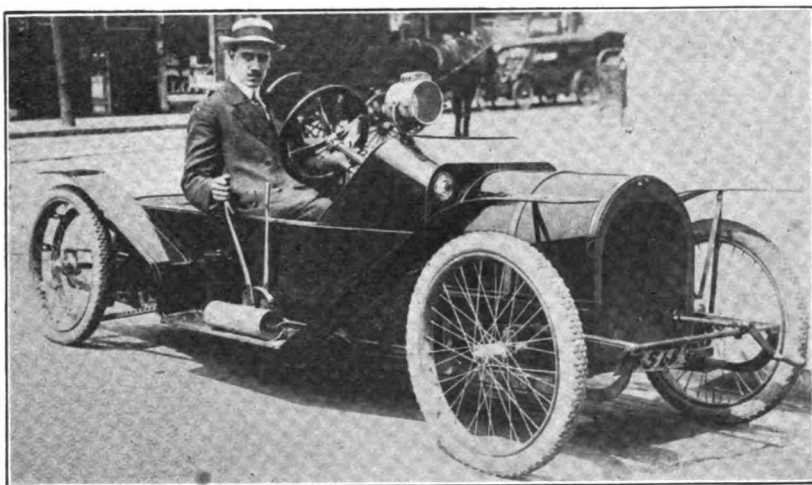
The smaller motor is of the motorcycle type, although it is stated that it was designed especially for this machine. It has a bore of 3.375 inches and stroke of 3.875, giving a piston displacement of 70 cubic inches. The valves are mechanically operated. The larger engine is of the T head type, with bore of 2.5 inches and stroke of 3.5, and a two-bearing crankshaft cut from solid steel.

Both machines utilize the friction transmission, power being taken from the engine to an aluminum plate by means of a large seamless tubing fitted with a universal joint at the motor end. The countershaft, placed transverse of the frame, carries a fibre disc, and final drive to the rear wheels is by two 1.25-inch V belts on the smaller car, and by double chain on the larger. The countershaft is mounted on two Hess-Bright ball bearings. It is maintained that no differential is needed, a special friction device being utilized, and that there are no gears on the machine outside of the engine.

The friction transmission is arranged to provide four forward speeds and reverse, the different speeds being engaged by a change speed lever

at the side. Another lever at the side operates the emergency brakes on the rear wheels, and in addition works the belt tightener on the smaller machine. The service brake is on the countershaft, and is operated by a pedal, another pedal actuating the clutch. Spark and throttle levers are on the steering post.

The frame on the smaller machine is of angle iron, reinforced by hard wood sills, this being of underslung construction, giving nine inches clearance. On the larger machine the frame is of angle steel, reinforced as above, and the clearance is 9.75 inches. It is stated that the larger machine has developed a speed of 60 miles an hour and has proved itself an excellent hill climber. Even when operated on freshly watered asphalt pavement it is said that there appeared to be no possibility of the wheels skidding.



Los Angeles Cyclecar, Designer L. E. French at the Wheel.

The wheels are the same for each machine, these being 28 inches in diameter with heavy single clincher rims, extra large double swedged spokes and special cyclecar knock-out axles. The tires are 2.75 inches, with an option of three-inch shoes at the difference in cost. The equipment includes side lights, tail lamp, horn, tire repair outfit, etc.

### COMET CYCLECAR COMING.

The Comet Cyclecar Company has been organized in Indianapolis, with E. R. and St. Clair Parry of the Parry Manufacturing Company, vehicle builder, and Marshall T. Levey of the Thornton-Levey Company, as incorporators. An office has been opened in the Century building in Indianapolis.



## EVERY POSTOFFICE AND TOWN.

### Progressive Candidate for Governor Is Covering Massachusetts Thoroughly.

Not since Paul Revere covered every Middlesex village and farm, has Massachusetts witnessed such a whirlwind tour as that in which Charles Sumner Bird, Progressive candidate for governor, is now engaged. Mr. Bird is covering every postoffice and town, going into the smallest hamlets as well as the largest cities, in his campaign for votes. The party, the strength of which may be gleaned from the accompanying illustration, is making the trip in four Stevens-Duryea cars, made by the Stevens-Duryea Company, Chicopee Falls, Mass.

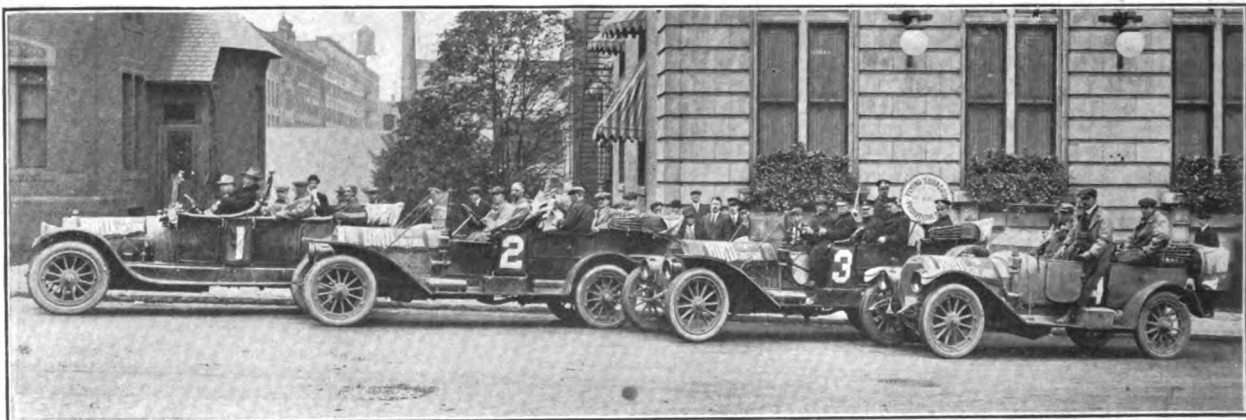
Mr. Bird is in the hands of his friends. That is to say that when he decided to make this tour he called upon Charles Henry Davis, South Yar-

vouched for by this party. During the first week some 590 miles were covered in the western portion of the state, which includes some of the steepest grades in the commonwealth. Weather conditions also have been far from ideal, rain and even snow being encountered almost every day for the better part of two weeks. Thus far, the machines have withstood the test remarkably, and there is every prospect that they will complete the entire schedule without difficulty.

## ON LONG TEST TRIP.

### Three Keeton Cars to Cover 2500 Miles Under Various Road Conditions.

In order to give the 1914 Keeton models a road test that shall in every respect indicate just what may be expected by the owner, H. H. Newsom, general manager of the Keeton Motor Com-



Charles Sumner Bird, Progressive Candidate for Governor in Massachusetts, and Party Touring State in Stevens-Duryea Cars.

mouth, Mass., to arrange the details and act as manager. Mr. Davis, who is president of the National Highways Association, is seen at the wheel of car No. 1, in the picture. Mr. Bird is beside him.

Car No. 1 is Mr. Davis' personal property and had been run some 12,000 miles previous to this tour. Cars Nos. 2 and 3 were engaged from the Stevens-Duryea agent, the J. W. Bowman Company, in Boston, and had been driven about 50,000 miles each. Car No. 4 also is owned by Mr. Davis, and had seen 27,000 miles in his service.

The itinerary is arranged to permit Mr. Bird to address the voters, regardless of the road conditions. Massachusetts has many miles of improved highways, but it also has some ways which are far from being improved, as can be

pany, Detroit, left that city Oct. 5, in charge of three cars for a 2500-mile trip over all sorts of roads. The route will lie from Detroit to Cincinnati, through Kentucky, Tennessee and Georgia to Atlanta, thence to Columbia, S. C.; Richmond, Va.; Washington, D. C.; Altoona and Pittsburg, Penn., and back to Detroit.

The trip has been well organized, and data will be obtained by a recording clerk who will travel in the rear car, recording every ounce of water and gasoline used, and every repair made or replacement effected. With complete records of the journey before them, the Keeton engineers will make such alterations as are necessary upon the models at the completion of the trip. The plan is a novel one, and Mr. Newsom believes it will prove a test for the machines that could be obtained in no other manner.



# IMPROVED ROADS AND MOTORING LAWS.

## Congressman Adamson's Bill Has Splendid Opportunity for Enactment--Resolutions Adopted by American Highway Association--Legislative Notes.

**M**OTOR tourists cannot help but be extremely interested in the bill introduced into Congress by William P. Adamson of Georgia, chairman of the committee on interstate and foreign commerce, providing for the regulation of "the interstate use of automobiles and all self-propelled vehicles which use the highways in interstate commerce." The bill reads in part as follows:

No person who shall have qualified by complying with the laws and regulations of the state, territory or district of his residence to use and operate such vehicle or vehicles (self-propelled), shall be required, in any other state or territory or district into which he may go for business or pleasure, to take out any additional license in order to use or operate any such machine.

It is probable that action upon the bill will be deferred until after the regular session of Congress is convened in December, but already there appears to be abundant evidence that its main provisions can be enacted into law. Motoring organizations are losing no time in bringing the matter to the attention of automobile owners with the expectation that they will use every effort to inform their representatives in Congress of their desires regarding the matter.

Touring motorists are familiar with the restrictions placed upon interstate touring, although they may not be able to quote from memory the various provisions of the several states. Several commonwealths have enacted so-called reciprocity laws covering this feature during the past two years. In most instances, these laws simply mean that the visiting motorist is allowed the same privileges as are accorded residents of the state in question when touring in the home state of the visitor.

In order to bring the situation with respect to the non-resident provisions of the various state laws more directly to mind at this time, the following resume is presented:

**Exempt**—Arkansas, Connecticut, Kentucky, Michigan, North Dakota, Ohio, Washington, Wisconsin.

**Reciprocity**—Alabama, Delaware, Idaho, Indiana, Iowa, Montana, New York, South Dakota, Vermont, West Virginia, District of Columbia.

**Exempt Temporarily**—California, Utah.

**Exempt 10 Days**—Massachusetts, \*New Hampshire, Pennsylvania, Rhode Island.

**Exempt Two Periods of Seven Days Each**—Maryland, Virginia.

**Exempt 15 Days**—New Jersey, North Carolina.

**Exempt 20 Days**—Missouri.

**Exempt 30 Days**—Colorado, Florida, Georgia, Kansas, \*Maine, Minnesota, Nebraska, Nevada, Oregon.

**Exempt 60 Days**—Illinois, New Mexico.

**Exempt Six Months**—Arizona.

**Not Exempt**—Oklahoma.

**No Provision**—South Carolina, Tennessee, Texas, Wyoming.

**No Law**—Louisiana, Mississippi.

\*Special provision for non-residents living within 15 miles of the state line.

It will be seen that there remains plenty of opportunity for changes before anything like uniformity may be expected from the states acting individually. Other attempts have been made to seek relief through federal enactment, but, heretofore, the effort has been toward the passage of a law requiring federal registration, the fees to be paid to the national government. It is suspected, not without reason, that this plan has failed because of its effect upon the doctrine of state rights.

The reason why it is felt that the present bill has much greater probability of passing lies in the fact that it does not attempt to regulate the manner in which states may provide for the registration of cars owned therein. It merely recognizes the doctrine of interstate commerce as applied to the automobile, whether used for pleasure or business, and provides that, having paid the fee required by the home state, no other shall be collected in another state.

### ASKS PRESIDENT'S AID.

#### American Highway Association Outlines Its Plan for National Road System.

While the recent road congress in Detroit was held under the auspices of the American Highway Association, other national bodies interested in good roads took part. The resolutions adopted during the closing sessions were prepared by the American Highway Association, and presumably reflect the position of that organization regarding the matters covered. Particular interest centres in the following sections:

Resolved, That the American Road Congress earnestly favors the creation of a national department of public works directed by a secretary, who shall be a member of the President's cabinet.

Resolved, That the American Road Congress favors state highway commissions and state aid for the construction and maintenance of the main roads of the several states.

Resolved, That the American Road Congress favors the establishment of a national road system, and favors



the construction by the states, counties and towns of the lateral and connecting market highways.

Resolved, That the American Road Congress respectfully requests the Congress of the United States to authorize the President to appoint a commission from civil life, with sufficient appropriation to make a thorough and exhaustive report on, and to recommend a system of federal aid.

Other resolutions called upon Congress to pass the necessary legislation so that the United States may hereafter be officially represented at the international roads congresses; indorsed the Lincoln Highway Association and its work, the compulsory use of wide tires, and the use of convict labor in the construction and maintenance of roads, and favored the long tenure in office of experienced and efficient highway officials.

### PENNSYLVANIA'S BOND ISSUE.

#### Motorists in Harrisburg Convention Launch Active Campaign in Its Favor.

The people of Pennsylvania will have opportunity next month to vote upon the constitutional amendment permitting the issuance of \$50,000,000 in bonds for the construction of highways in compliance with a state highway system laid down by the legislature two years ago. Early in this month, motorists and other interested citizens held a monster convention in Harrisburg, for the purpose of meeting objections to the proposition and formulating a campaign in favor of the passage of the amendment.

It will be understood that the favorable action on the part of the voters will mean that the legislature may issue bonds and prepare for the work. Governor Tener already has stated that he will not call a special session of the present legislature for this purpose, but, if the amendment passes, the new legislature of 1915, to be elected next year, will have charge of this work. It is presumed that the bonds will be issued as required and for such sums as seem desirable in view of the work planned.

### CAUSES FOR ACCIDENTS

#### Investigator Finds That Published Statistics Create an Erroneous Impression.

During the past year or so certain organizations have been collecting and publishing monthly statistics, with the apparent object of indicating that the motorists as a class are growing more careless. James P. Proctor has examined some of these statistics, with the result that he is convinced the accidents are due more to the

carelessness of the pedestrian than to that of the driver. He says:

Automobile owners and drivers are much concerned over this situation, as they are blamed generally for something in which the fault lies elsewhere. When accused of a lack of consideration for pedestrians, they assert that it is a poor rule that will not work both ways, and claim that pedestrians generally are so supremely reckless that were it not for the extraordinary care exercised by motor car drivers, accidents would be 100 times more frequent. It is not denied that there are some unheeding drivers, but the percentage is very small.

To take a short trip through the heart of the city in an automobile is to open one's eyes to the amazing indifference of the public. People stroll down the centre of the most crowded streets, calmly ignoring the fact that the motor cars have some rights there. Women stop to gossip directly in the path of scores of vehicles. In getting on and off street cars, not one person in 10 pays the least attention to where he jumps, but dashes wildly across the pavement, dodging here and there in absolute recklessness. Mothers allow their two and three-year-old babies to crawl and toddle into the middle of busy thoroughfares. Meanwhile the anxious and harassed automobile drivers vainly shift gears, put on brakes, blow horns and dodge back and forth among the criminally reckless populace, knowing that the slightest scratch on a pedestrian almost exposes the man in the car to lynching.

If a further proof be needed, the situation in respect to a signal may be mentioned. A few years ago the bulb horn was apparently a satisfactory means of warning. Now, so callous has the no-car owning public become, the formerly hated and obnoxious Klaxon is slowly but surely becoming so necessary that many municipalities are insisting upon its use as a minimum danger signal. This gradual change has not been brought about by the growing recklessness of motor car drivers, but by the increasing carelessness of pedestrians, insofar as automobiles and all motor driven traffic is concerned.

### LEGISLATIVE BRIEFS, ETC.

Governor Colquitt of Texas has issued a proclamation naming Nov. 5-6 as good roads days. Each man is expected to contribute either two days' labor or its equivalent in cash for improved highways. The plan is similar to that which was given expression in Kansas and Missouri recently.

The first prosecution under the new law of Wisconsin, which provides a maximum fine of \$1000, or imprisonment for five years, for using a car without the owner's permission, took place at Portage recently, when two boys, 17 and 18 years of age, pleaded guilty and were fined \$200 each. Under the old law the maximum penalty was a fine of \$50.

Motorists in Dauphin county, Pennsylvania, have instituted mandamus proceedings against Auditor-General A. W. Powell, to show cause why he withholds the income from motor car registration fees, which, under the terms of the act of 1913, should be diverted to the state highway department for the improvement of roads. The auditor-general holds that the specific appropriation act of 1909 stands in the way of his making such payment.

Secretary of State May of New York announces that 130,000 automobiles were registered in that commonwealth previous to Oct. 1, an increase of about 30,000 over the corresponding period in 1912. The gain in commercial vehicles was very notable, there being an increase of 6000, or 46 per cent., against 32 per cent. for all vehicles registered. The aggregate receipts were about \$1,235,000, or just about equal to the combined receipts in 1910 and 1911.

Maintaining that the new Ohio motor vehicle law not only increases the amount of tax to be paid by owners, in the form of a registration fee, but provides that only one-third, instead of all, the money thus raised shall be devoted to improved road construction, automobile clubs in that state have taken steps to test the matter in the courts. A new club recently was organized in Lima, having for its principal object the assistance of the state association in this work.



## CORRESPONDENCE WITH THE READER.

**New York Laws and Car Lighting.**

(1658)—Being a regular subscriber to your valuable journal, I would like to ask you a question through the Correspondence columns. Can you tell me if there is a section of the New York automobile laws which reads, "When an owner obtains a license for a new car and for each succeeding year renews the license for the same, that the fourth year and each succeeding year he renews it, he is entitled to a reissue at one-half the original tax"? That is, if a new car is registered for \$10 the first year, will the tax for the fourth and succeeding years be \$5?

Can you tell me if it is practical to obtain enough electricity from a Splitdorf magneto such as is utilized on a 30 horsepower, 1910 four-cylinder car, to light the car satisfactorily without injuring the efficiency of the spark for the motor? If so, how should it be wired and what would be the cost, labor not considered? R. E. D.  
New York City, Oct. 10.

The motoring law of New York State, as passed in 1910, was amended by the legislatures of 1911 and 1913. A careful reading of the present law fails to reveal any other mention of a reduction in fee, under the circumstances cited, than that which follows, this being a portion of article 282, section 6:

Provided that if a motor vehicle other than one used solely for commercial purposes shall have been licensed for four separate years hereunder and for which there shall have been paid the annual registration fees herein provided during said period, the annual registration fees thereafter shall be one-half the amount.

It would not be practical to endeavor to utilize the current from the magneto for lighting purposes, as the instrument is designed and intended solely for ignition work.

**Making Hot Air Device.**

(1659)—I have a car fitted with a Schebler carburetor of the old type. The air valve is located on top. It is a model much used on marine engines. Noting that the use of heated air helps the carburetor, I would appreciate any suggestion as how to make a connection between the exhaust manifold and the air intake of the carburetor. A friend of mine, who is an old subscriber of your book, states you published an article of this nature some time ago.  
APPRECIATIVE.

Portland, Me., Oct. 15.

The connections referred to can be purchased ready made, or if a special size is required it may be ordered through a dealer or supply house. The manufactured article comprises a hood for the exhaust manifold, a clamp for attaching one end of the flexible tube and the piping.

The home made device referred to is shown at Fig. 2 and was utilized by a reader of The Automobile Journal. For the hood device an empty preserve can was employed, it being cut longitudinally and the ends cut as shown at b, and two holes bored as at k. The part a was made of tin and provided with extensions as illustrated. This member was inserted in the hood as indicated at d. By making a snug fit rattling was prevented.

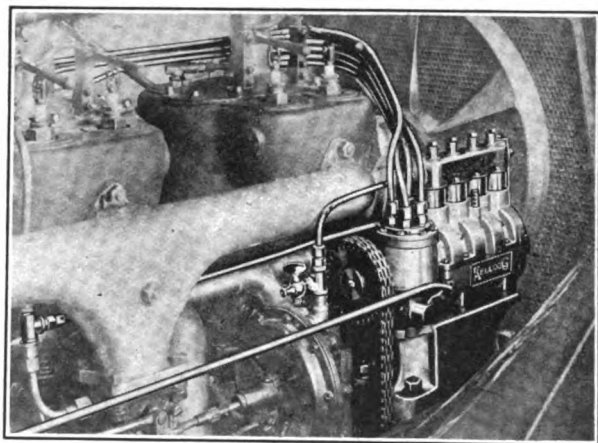
The tube c was of ordinary garden hose, the

member a being made to slip inside of it. The hood attached is shown at f, and it will be noted that holes are punched to admit air, the number of perforations being augmented according to the requirements of the carburetor. The manner of attaching the hood is shown at e. As previously mentioned, the ready made article would save considerable labor and time, and it is not expensive.

**Operation of Air Starters.**

(1660)—Will you explain the operation of a compressed air motor starter? What advantage has it, if any, over the electric?  
OLD SUBSCRIBER.  
Newport, R. I., Oct. 13.

The compressed air motor starting system as applied to a motor car comprises a tank containing compressed air, a pump to maintain the supply, a distributing mechanism and a valve operated by the driver. At Fig. 1 is shown the pump,



**Fig. 1—Showing the Distributor and Pump Utilized with a Compressed Air Motor Starting System, Also the Leads to the Cylinders.**

also the distributor and method of driving the first named member.

The air is led from the tank to the distributor, which has ports, one for each cylinder, and leading from the ports is a pipe or tube through which the air passes to the cylinder. The distributor is driven in much the same manner as a timer, the ports opening when the piston is at the top of the compression stroke, so that when the air is admitted it will force the piston down as on the conventional firing stroke. Check valves are utilized in the cylinder connections to prevent the air from returning to the distributor.

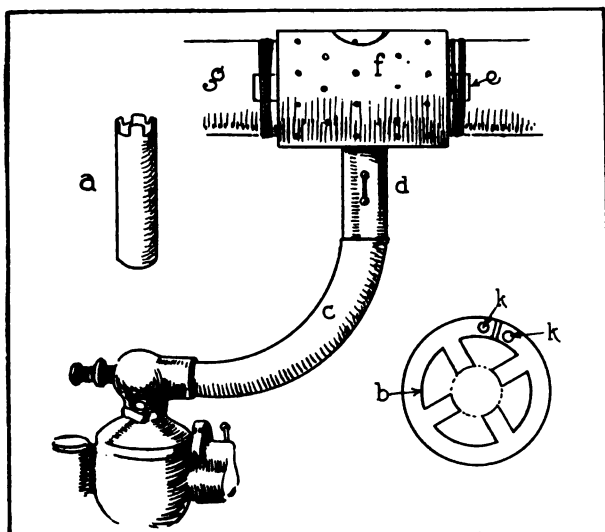
One of the advantages claimed for the system is that undesirable stresses are eliminated by applying the energy to the piston head.



**Faults on the Battery.**

(1661)—I have a 1910 model 19 Buick equipped with a Remy magneto. Lately I have experienced trouble when starting the car on the batteries. It misses badly when running on the batteries, although I put in a new set of cells. The wiring and spark plugs appear to be all right. The motor runs good on the magneto. Will you tell me the trouble and oblige a subscriber? J. S. G.  
Fall River, Mass., Oct. 11.

With the Remy magneto the current is transformed by a coil and the fact that the motor operates satisfactorily indicates that the fault is not in the instrument, but in the battery circuit. The current from the cells is interrupted or broken by the circuit breaker of the magneto, transformed by the coil, then carried to the distributor and thence to the plugs. There evidently is a faulty connection between the cells and the coil and these members should be examined carefully. It is possible that the battery side of the switch is



**Fig. 2—Working Plan of Home Made Hot Air Device for Schebler Carburetor.**

not making a good contact or the terminals are loose. Check up each lead and connection carefully. With the motor operating, test the switch by actuating the lever. Be sure that the wires are installed according to the maker's instruction.

**Wiring Pfanstiel Magneto.**

(1662)—I am having trouble in rewiring the magneto on my car. It is a Pfanstiel, dual system, using dry cells. Kindly publish or forward me the wiring diagram at your earliest convenience. CONSTANT READER.  
Rutland, Vt., Oct. 16.

Presuming that the magneto referred to is similar to that illustrated at Fig. 3, six cells are employed. These are wired in series-parallel and the lead from the zinc terminal is connected to the terminal marked 3. The other wire from the

batteries is carried to the switch to terminal 1. The ground is from switch terminal 6 to frame. It will be noted that the lead 3 is also connected to the magneto terminal 8, and that the terminal 9 on the instrument is connected by a lead to terminal 4 of the switch. Magneto terminal 7 and switch terminal 5 are also connected.

Connections 4 and 9 carry current from the armature to the switch, and the wire leading from 3 to 8 permits the magneto to operate as a self-contained instrument when the switch lever is in magneto position. One end of the battery is connected to point 3, the other to terminal 1, as previously stated, but as the circuit is open when the switch lever is either in the magneto or off positions, the battery is inoperative at this time. The wire connecting switch terminal 3 to contact breaker terminal 8 forms the connection whereby the armature current is intermittently connected and separated by the breaker points.

When the switch lever is thrown to the battery side, coil connection 7 is placed in circuit with 5 and 1, making it possible for the battery current to flow to the coil. A push button is provided at the side of the switch for starting, and when this is depressed the ground connection 6 is brought into electrical connection with point 3, and the battery current is grounded through a short shunt, instead of by the contact breaker points at terminal 8. With this system one taps the button instead of maintaining a continual contact as with the vibrator type of coil. When six cells are employed as shown, the voltage of but two is utilized, it being held to be sufficient, as the resistance of the primary of the transformer coil is so proportioned that the core is energized with very low potential current.

**Ford Motor Starter.**

(1663)—Would it be possible to fit an electric motor starter to a model T Ford car, and what would be the cost? Do you know of any company making an electric starter for this car? FORD OWNER.  
Nashville, Tenn., Oct. 11.

An electric motor starter could be fitted to a model T Ford car but it would involve considerable expense. With an electric system a generator would be required to maintain the storage battery in a charged condition, and as the fly-wheel generator of the Ford car develops an alternating current, it could not be employed for charging the cells, since a direct current is necessary.

It would mean the installation of a dynamo, also a motor, and while a unit system would be utilized to save space, the cost as above mentioned would be considerable. The writer cannot give figures. These could be obtained from man-



ufacturers of lighting and starting systems, who are listed in the Buyers' Guide, published in each issue of The Automobile Journal. The writer does not know of any company making an electric motor starting system designed especially for the Ford car. There are several mechanical starters made for these machines, one of which is described and illustrated in this issue.

#### Leaky Radiator.

(1664)—I have an old car with a honeycomb type of radiator which leaks badly. It has been soldered a number of times, but after a while will leak. As the cold weather is coming and there is no heat in my garage, I must use an anti-freezing solution or draw off the water when the car is not in use. This is a nuisance. I note that Se-ment-ol is advertised for stopping leaks in radiators. Is this as represented and will it do the work as they claim it will? Will alcohol affect the solution?

SKEPTICAL.

Braddock, Penn., Oct. 15.

According to a number of owners who have used the radiator solution referred to, it is efficient and maintains the claims of the maker. The writer can vouch for Se-ment-ol, made by the Northwestern Chemical Company, Marietta, O., which is inexpensive and can be procured at any supply house.

It was employed in a honeycomb radiator which leaked badly and although an anti-freezing solution was utilized, no further trouble was experienced during the winter. In the spring the radiator was cleaned out and water used. As far as the writer could ascertain the cooler was as efficient as formerly.

The principle of these radiator compounds is a self-hardening solution which hardens when exposed to the air. The writer obtained the best results with the solution by having the water warm, and, with the motor operating, small quantities of the ingredient were poured into the cooler through the filler cap. The car was then run for a short distance and the solution emptied. It was allowed to stand for some little time before replenishing the supply of water, which was later replaced by an anti-freezing solution.

The effect of alcohol upon the radiator compound is not known to the writer, who employed a chemical anti-freezing solution. It is doubtful if alcohol would have any effect on it, as this and other factors were considered by the maker.

Henry W. Nuckols, who was president of the Columbia Motor Car Company, Hartford, Conn., previous to the reorganization of the old United States Motor Company, has become general assistant to Milton J. Budlong, president of the Packard Motor Companies of New York, Chicago and Philadelphia.

#### ISSUES NEW BEARING DATA.

#### J. S. Bretz Company, Importer, Is Mailing New List to the Trade.

The J. S. Bretz Company, 250 West 54th street, New York City, sole importer of the F & S annular ball bearings, is mailing the trade a new booklet which cancels all previous lists relative to the product handled by this concern. The various types are illustrated, including the light, medium and heavy series, also the narrow types, and dimension diagrams are presented. Each bearing is listed, giving the outer diameter, bore and width, ball diameter and number of balls. The load-pounds given are the highest proper for steady loads and speeds.

The dimensions are given in millimeters, but

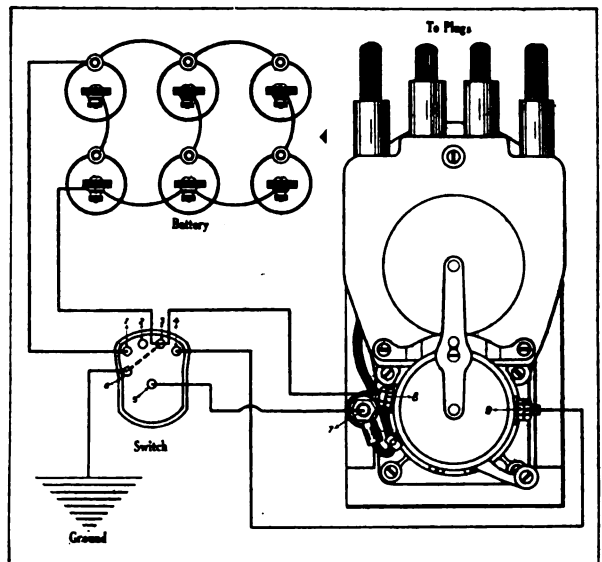


Fig. 3—Wiring Plan of Pfanstiehl Dual System Employing Batteries and Magneto.

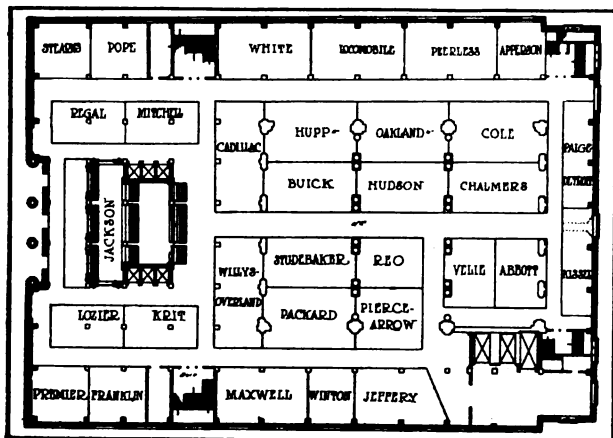
a table of inch equivalents is included, making it a simple matter to convert the measure. Special tables will be supplied on request for other speeds and loads, and for extra sizes where their use is indicated. The single annular type fitted with the narrow ribbon ball separator and the W. H. narrow width ball separator are well known to the trade and the data on these will be of service to the garage, repairman and service station, as sizes and prices have been revised to Sept. 1.

It transpires that the Reo car, driven to second place in the 102-mile race at Corona, Cal., last month, completed the entire distance without stop and without taking water, and was the only machine in the race to make this record.



## NEW YORK AND CHICAGO CAR EXHIBITORS.

**E**IGHTY makers of pleasure cars, one of whom is a producer of electric machines, have been assigned space for the 14th annual national



Main Floor, Grand Central Palace, New York City.

automobile show in the Grand Central Palace, New York City, Jan. 3-10, under the auspices of the Automobile Chamber of Commerce. Eighty-six makers, three of them makers of electrics, have been assigned space for the 14th annual show in the Coliseum, Annex and First Regiment armory in Chicago, Jan. 24-31, under the same auspices. These figures will be increased slightly when the members of the Electric Vehicle Manufacturers' Association have received their assignments, although it would appear that there are but three spaces left in New York and nine in Chicago.

For the 13th annual show, there were 85 different makes of cars represented in the two buildings, Madison Square Garden and Grand Central Palace, in New York. There were 102 different makes at the Chicago show of 1913. Several concerns represented at both shows a year ago are no longer manufacturing cars, but this does not account for all the absentees.

Among those who made display last January, but who will not be represented this season, are the following makes: Alco, Bergdoll, Chevrolet, Columbia, Cunningham, Cutting, Detroit, Edwards-Knight, Empire, Firestone-Columbus, Flanders, Inter-State, Knox, Lenox, Little, Marathon, Matheson, Michigan, Midland, Schacht, Selden, S. G. V., and R-C-H. The electric vehicles not yet heard from this year are: Argo, Baker, Borland, Broc, Buffalo, Columbus, Detroit, Hupp-Yeats, Ohio, Rauch & Lang, Waverley and Woods. Most of these are members of the Electric Vehicle Manufacturers' Association,

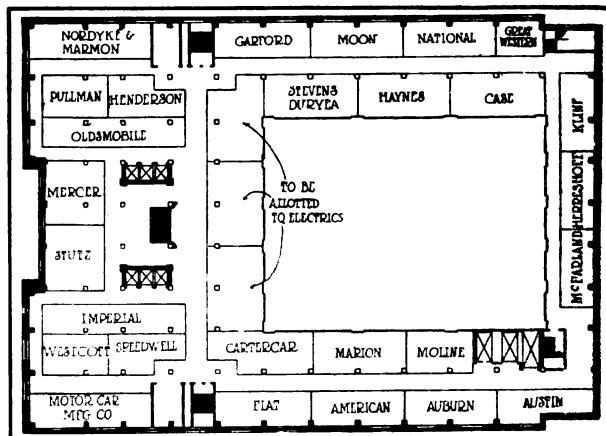
and may reasonably be expected to make application for space through that organization.

Cars showing at New York this season, which were not seen there last are: Apperson, Austin, Aristos, Chandler, Cornelian, Great Western, McFarlan, Lyons-Knight, Simplex, Partin-Palmer, Twombly, McIntyre, Howard, Palmer-Singer and Vaughn. Avery, Cricket, McCord and Vulcan are new names for Chicago. Most of these are new cars, placed in the market since the last show season.

The full list of those to whom space has been allotted, according to advices from the Automobile Chamber of Commerce, is as follows:

### New York and Chicago.

F. B. Stearns Co., Cleveland, O., Stearns-Knight. Pope Mfg. Co., Hartford, Conn., Pope-Hartford. White Co., Cleveland, O., White. Locomobile Co. of America, Bridgeport, Conn., Locomobile. Peerless Motor Car Co., Cleveland, O., Peerless. Apperson Bros. Automobile Co., Kokomo, Ind., Apperson. Paige-Detroit Motor Car Co., Detroit, Paige. Kissel Motor Car Co., Hartford, Wis., Kissel-Kar. Regal Motor Car Co., Detroit, Regal. Mitchell-Lewis Motor Co., Racine, Wis., Mitchell. Cadillac Motor Car Co., Detroit, Cadillac. Hupp Motor Car Co., Detroit, Hupmobile. Oakland Motor Car Co., Pontiac, Mich., Oakland. Cole Motor Car Co., Indianapolis, Ind., Cole. Buick Motor Co., Flint, Mich., Buick. Hudson Motor Car Co., Detroit, Hudson. Chalmers Motor Co., Detroit, Chalmers. Willys-Overland Co., Toledo, O., Overland. Studebaker Corp., Detroit, Studebaker. Packard Motor Car Co., Detroit, Packard. Reo Motor Car Co., Lansing, Mich., Reo. Pierce-Arrow Motor Car Co., Buffalo, N. Y., Pierce-Arrow. Velle Motor Vehicle Co., Moline, Ill., Velle. Abbott Motor Co., Detroit, Abbott-Detroit. Jackson Automobile Co., Jackson, Mich., Jackson. Lozier Motor Co., Detroit, Lozier. K-R-I-T Motor Car Co., Detroit, K-R-I-T. Premier Motor Mfg. Co., Indianapolis, Ind., Premier.

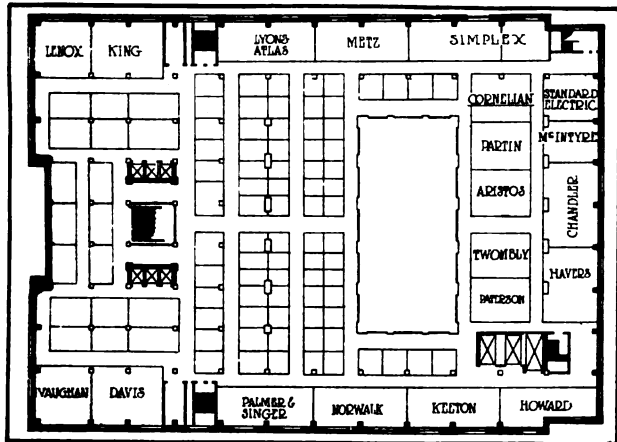


Second Floor, Grand Central Palace, New York City.

H. H. Franklin Mfg. Co., Syracuse, N. Y., Franklin. Maxwell Motor Co., Detroit, Maxwell. Winton Motor Car Co., Cleveland, O., Winton. Thomas B. Jeffery Co., Kenosha, Wis., Rambler.



Nordyke & Marmon Co., Indianapolis, Ind., Marmon.  
 Pullman Motor Car Co., York, Penn., Pullman.  
 Henderson Motor Car Co., Indianapolis, Ind., Henderson.  
 Olds Motor Works, Lansing, Mich., Oldsmobile.



Third Floor, Grand Central Palace, New York City—Unassigned Spaces for Accessory Exhibitors.

Mercer Automobile Co., Trenton, N. J., Mercer.  
 Stutz Motor Car Co., Indianapolis, Ind., Stutz.  
 Imperial Automobile Co., Jackson, Mich., Imperial.  
 Westcott Motor Car Co., Richmond, Ind., Westcott.  
 Speedwell Motor Car Co., Dayton, O., Speedwell.  
 Motor Car Mfg. Co., Indianapolis, Ind., Pathfinder.  
 Garford Co., Elyria, O., Garford.  
 Moon Motor Car Co., St. Louis, Mo., Moon.  
 National Motor Vehicle Co., Indianapolis, Ind., National.  
 Great Western Automobile Co., Peru, Ind., Great Western.  
 Stevens-Duryea Co., Chicopee Falls, Mass., Stevens-Duryea.

Haynes Automobile Co., Kokomo, Ind., Haynes.  
 J. I. Case Threshing Mch. Co., Racine, Wis., Case.  
 Herreshoff Motor Co., Detroit, Herreshoff.  
 McFarlan Motor Car Co., Connersville, Ind., McFarlan.  
 Cartercar Co., Pontiac, Mich., Cartercar.  
 Marlon Motor Car Co., Indianapolis, Ind., Marlon.  
 Moline Automobile Co., East Moline, Ill., Moline.  
 Fiat Automobile Co., Poughkeepsie, N. Y., Fiat.  
 American Motors Co., Indianapolis, Ind., American.  
 Auburn Automobile Co., Auburn, Ind., Auburn.  
 Austin Automobile Co., Grand Rapids, Mich., Austin.  
 Lomax Motor Car Co., Lomax, Ill., Lomax.  
 King Motor Car Co., Detroit, King.  
 Lyons-Atlas Co., Indianapolis, Ind., Lyons-Knight.  
 Metz Co., Waltham, Mass., Metz.  
 Simplex Automobile Co., New York City, Simplex.  
 Cornelian Motor Co., Kalamazoo, Mich., Cornelian.

W. H. McIntyre Co., Auburn, Ind., McIntyre.  
 Chandler Motor Car Co., Cleveland, O., Chandler.  
 Havers Motor Car Co., Port Huron, Mich., Havers.  
 Howard Motor Car Co., Connersville, Ind., Howard.  
 Keeton Motor Car Co., Detroit, Keeton.  
 Palmer & Singer Mfg. Co., Long Island City, N. Y., Palmer-Singer.

G. W. Davis Carriage Co., Richmond, Ind., Davis.  
 Vaughn Car Co., Kingston, N. Y., Vaughn.

#### New York Only.

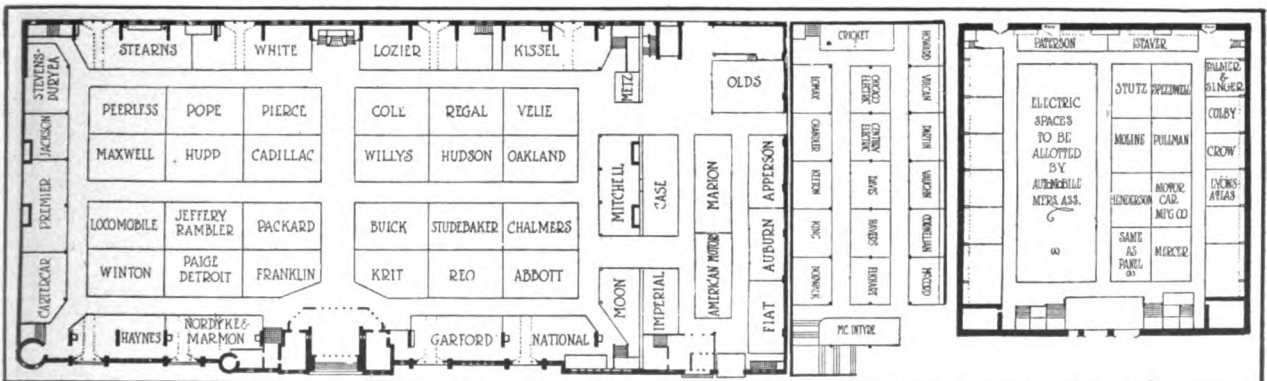
Kline Motor Car Corp., Richmond, Va., Kline-Kar.  
 Aristos Co., New York City, Mondex-Magic.  
 Twombly Motors Co., New York City, Twombly.

#### Chicago Only.

Vulcan Mfg. Co., Painesville, O., Vulcan.  
 Colby Motors Co., Mason City, Ia., Colby.  
 Crow Motor Car Co., Elkhart, Ind., Crow Elk-Hart.  
 Avery Co., Peoria, Ill., Avery.  
 Elkhart Carriage & Harness Co., Elkhart, Ind., Pratt.  
 Batholomew Co., Peoria, Ill., Glide.  
 Staver Carriage Co., Chicago, Staver.  
 Chicago Electric Motor Car Co., Chicago, Chicago electric.  
 Century Electric Car Co., Detroit, Century electric.  
 McCord Auto Co., \_\_\_\_\_  
 Cricket Cyclecar Co., \_\_\_\_\_

It is stated in this connection that the Motor & Accessory Manufacturers has declined to sanction any other show than those to be held in New York and Chicago. This is taken to mean that members of the association, as such, will be unable to make display at the forthcoming Boston show, contrary to the plan which has been in force with that exhibition for some years. Among the makers of accessories, parts or fittings, who have previously made display at New York and Chicago, but who are quoted as not contemplating such action this season, are the following:

Republic Rubber Co., Youngstown, O.  
 Kelly-Springfield Tire Co., New York City.  
 Fisk Rubber Co., Chicopee Falls, Mass.  
 B. F. Goodrich Co., Akron, O.  
 Ajax-Grieb Rubber Co., Trenton, N. J.  
 Swinehart Tire & Rubber Co., Akron, O.  
 Firestone Tire & Rubber Co., Akron, O.  
 Goodyear Tire & Rubber Co., Akron, O.  
 Diamond Rubber Co., Akron, O.  
 Michelin Tire Co., Milltown, N. J.  
 United States Tire Co., New York City.  
 Norma Co. of America, New York City.  
 Timken Roller Bearing Co., Canton, O.  
 Hess-Bright Mfg. Co., Philadelphia.  
 Bower Roller Bearing Co., Detroit.



Chicago Car Display Spaces: From Left to Right, Colliseum, Colliseum Basement and Main Floor, First Regiment Armory—Heavy Black Lines Denote Side Walls and Buildings.

Partin-Palmer Mfg. Co., Chicago, Ill., Partin-Palmer.  
 W. A. Paterson Co., Flint, Mich., Paterson.  
 Standard Electric Car Co., Jackson, Mich., Standard electric.

American Ball Bearing Co., Cleveland, O.  
 Hyatt Roller Bearing Co., Detroit.  
 Standard Roller Bearing Co., Philadelphia.  
 J. S. Bretz Co., New York City.



### AN OLD FASHIONED FAMILY.

#### Large in Numbers but Happy in the Possession of a Six-Cylinder KisselKar.

Thomas H. Seed, a farmer of Bridgeport, Ill., is the head of an old fashioned family, insofar as numbers are concerned, for the roster totals 20 happy souls, including children and grandchildren. In every other respect the Seed household is completely up-to-date, and none the least of these modern features is the six-cylinder, 60 horsepower KisselKar, made by the Kissel Motor Car Company, Hartford, Wis.

Mr. Seed is a firm convert to the use of the automobile. In fact, he finds it of inestimable value as well as a source of much pleasure to "the women and kiddy folks." When it becomes

August and the largest of all, 292, in September.

In this connection, it also is of interest to note that the W. D. Newerf Rubber Company, Los Angeles and San Francisco, has been appointed distributor for the products of this company, Invader lubricants and I. O. C. gear oil, in California, Nevada, Utah and Arizona. The closing of this contract was one of the first duties of General Manager Scheu, who was until recently manager of the Boston branch of the company.

### OFFERS SEVEN PRIZES.

#### People of Massachusetts Have Opportunity to Tell What They Think of Horns.

The Lovell-McConnell Manufacturing Company, Newark, N. J., maker of Klaxon horns, offers seven prizes for competition among the residents of Massachusetts for the best suggestions as to how to regulate the use of warning signals on automobiles. The suggestions must be limited to 400 words, written on one side of the paper only, and mailed to the Warning Signal Committee, Drawer 2302, Boston postoffice, prior to Nov. 10, on which date the contest closes.

The first prize is to be \$150, the second \$50, and the five next \$10 each. The suggestions must be made by bona fide residents of Massachusetts and be an expression of individual opinion. The judges of the contest will be: William L. Douglas, Brockton, a former governor; James A. Gallivan, Boston, chairman of the board of street commissioners; George S. Ladd, Sturbridge, a member of the executive committee of the Massachusetts State Grange and of the bureau of highways, United States Department of Agriculture, and Daniel F. Gay, Worcester, director of the Automobile Legal Association, former president of the Worcester Automobile Club and a director of the American Automobile Association.

George F. Rein of Omaha, driving a 1914 Cadillac, recently established a new cross country record from Detroit to Omaha, covering the 911 miles in an elapsed time of 31:54:00, and an actual running time of 29:12:00.



Thomas H. Seed, Bridgeport, Ill., Some of His Family and His Six-Cylinder 60 Horsepower KisselKar.

necessary to run errands to town, it is a matter of minutes, as against hours in the old days, when Dobbin had to be "hitched" for the trip. "I don't see how I was able to putter along without one for so many years", says Mr. Seed.

### INVADER OIL NEWS.

#### Business Is Increasing Very Rapidly—New Pacific Coast Representative.

According to E. A. Scheu, general manager of the Invader Oil Company, New York City, the business of that concern has increased an average of 212 per cent. a month since the first of the year, or to be specific, there was an increase of 114 per cent. in February, 188 in March, 200 in April, 246 in May, 231 in June, 210 in July, 218 in



## 1914 OLDSMOBILE HAS A LARGER MOTOR.

**T**HE 1914 line of the Olds Motor Works, Lansing, Mich., will comprise one six-cylinder chassis, which will be constructed in two forms, one with a wheelbase of 139 inches, to which will be fitted a seven-passenger body, and the other with a wheelbase of 132 inches for four and five-passenger bodies. A reduction in price over the 1913 line is announced, and the model 54 also presents several new features.

The motor is of the L head type with the cylinders cast in pairs, having a bore of 4.25 inches and stroke of 5.25, as against 4.125 by 4.75 of this year's model, and being rated at 43.9 horsepower under the S. A. E. formula. The valves have been increased and the intake manifold, water headers and fan blades are white enamelled. Ignition is by the Delco system; the carburetor is an improved type and cooling is now by a centrifugal pump instead of a gear, it being located in the centre and the shaft extended to drive the generator. At the other end of the pump shaft is located the Taylor Noil tire pump. Lubrication is by combined force feed and splash. The new motor has no pan and the exhaust pipe is finished to be rust proof.

The cone clutch and selective type of transmission is retained, these being a unit with the motor. The drive shaft is enclosed in a torsion tube, transmitting the power to a floating axle. F. & S. bearings are utilized in the rear construction and Timken are used in front wheels.

The rear springs have been lengthened, three-quarter elliptic, and are underslung. The front members are semi-elliptic. The diameter of the

brake drums has been increased, also the face, permitting of the use of lining 2.375 inches wide, the service brake being of the contracting type and the emergency of expanding design. Both sets are faced with Raybestos and carefully equalized.

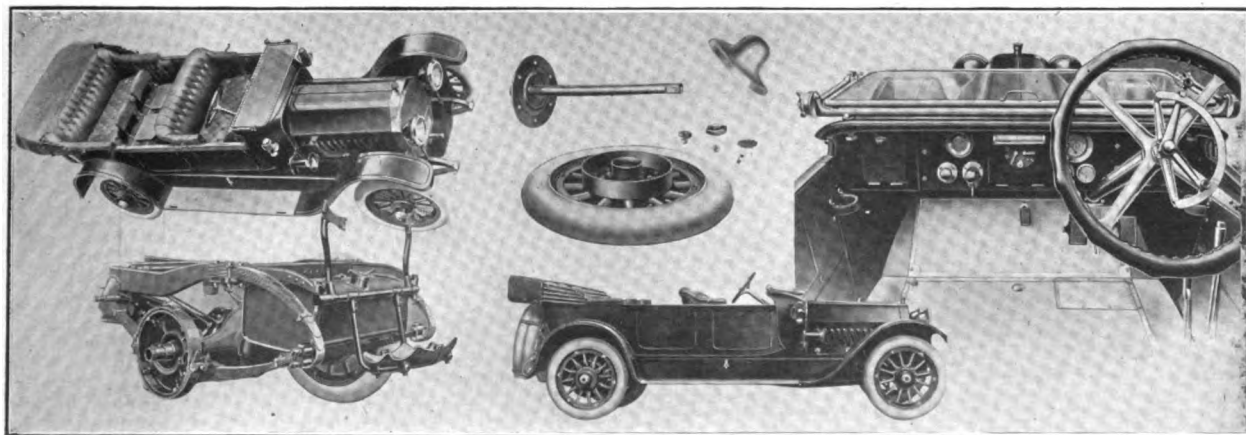
The 1913 model was equipped with 36 by 4.5-

inch tires in front and 37 by five in the rear, but these have been changed to 36 by five all around, and are mounted on Baker straight side demountable rims, the two spare members being carried on a special bracket at the rear of the chassis, where they also serve to protect the fuel tank. This tank has a capacity of 23 gallons, with a reserve of three gallons. Partitions are provided to prevent splashing of the fluid. The filler cap is ample in size, eliminating the use of a funnel.

The driver is placed at the right and the wheel is 19 inches in diameter, of Circassian walnut, corrugated on the inside and knobbed outside. The seven-passenger body is equipped with the disappearing type of extra seats, these folding into the rear of the driver's compartment and being neat in design. The running boards are clean and are covered with aluminum instead of fibre. The toeboards are also metal covered. The body lines are practically unchanged. A Circassian walnut cowl has been adopted.

### DETAILS OF MODEL 54 OLDSMOBILE.

**Taylor Noil Pump.**  
**New Type of Jiffy Curtains.**  
**Tire Size, 36 by 5, All Around.**  
**Seven, Five and Four-Passenger Bodies.**  
**Delco Lighting and Motor Starting System Adopted.**  
**Disappearing Extra Seats in Seven-Passenger Model.**  
**Larger Motor with Bore of 4¼ Inches and Stroke of 5¼.**  
**One Six-Cylinder Chassis with Wheelbase of 132 and 139 Inches.**  
**Longer Underslung Rear Springs and Slight Change in Rear Axle.**



Showing the 1914 Oldsmobile with a Larger Motor, Underslung Rear Springs, Flush Cowl Instrument Board and a Number of Other Refinements.



# CHARACTERISTICS OF HEAVY FUELS.

## Part V--Effects and Difficulties Attendant upon the Use of the Ordinary Butterfly Throttle Valve When Carbureting Kerosene--Substitutes Suggested.

**I**N THE previous installment causes of internal condensation were discussed, also factors making for a smoky exhaust when kerosene is utilized in the automobile engine. The views of two English authorities were presented and one of these, R. Owen Allsop, contends that the ordinary butterfly valve should be modified or eliminated if designers of kerosene carburetors are to meet with success. He holds that the control of the air passing the jet is important in order that the fuel disintegrating force may be effective and constant. He states:

No doubt there are frictional effects and effects relating to internal liquid stresses and surface tension that are factors, but, primarily, we must conceive that the air particle strikes the fuel particle, and that the ef-

by high velocity passes by the jet, as shown by dotted arrows, the main air being indicated by black arrows entering at holes in the sleeve.

### Varying Spray Quality.

All these designs seem to lend themselves better than the butterfly type to the attainment of a constant air blast. No doubt the position is rendered difficult in dealing with heavy fuel because that which may be workable with gasoline may be useless with kerosene. This is shown by the constant mixture aspect of carburetion problems. The invisibility of the products of imperfect combustion of gasoline permits the gasoline carburetor designer to concentrate on the gaining of a suitable mixture at all engine speeds. Little attention has been given to the effect of varying spray quality—none in fact, if we accept the atomizer jet, and devices for ready starting of the engine. And no mere atomizing jet will meet the petroleum spraying difficulty unless it has also accompanying means of proper air control.

### Air Valves and Taper Needles.

Numbers of gasoline carburetor designers have proceeded on a main principle of air control valve connected to a taper needle, generally as shown at Fig. 24, where the main air valve is connected to the taper needle inserted in the fuel jet, air entering as indicated by the arrows. And some designers have included movable choke tubes, whereby a certain measure of constancy of air flow past the jet would result, generally as shown at Fig. 25, where the main air valve carries a movable choke, which, as at A, at low speed restricts the air way round jet, and, at B, opens more way for air at full power. We say "would result" designedly, because above the carburetor mechanism there is the butterfly throttle which, constantly operated by the car driver, disorganizes the whole arrangement as respects position of highest air velocity.

In the ordinary butterfly type throttled carburetor the zone of greatest air velocity oscillates back and forth now at the jet, now at the throttle disc edges, all plainly at variance with the principles of spraying that is a necessity in kerosene carburetor design. At present our fuel spraying air is as inconsistent as the wind itself. The air blast for spraying must be controllable as to amount, duration and force, placing in the hands of the driver a real control of operating conditions.

### Substitutes for Throttle.

In looking around for a substitute for the ordinary throttle the immediate difficulty is the clashing of the interests of mixture as such and of the requirements of fuel pulverization. Correct mixture the oil engine designer must secure, but the mere arrangement of a variable shaped spindle or taper needle, and its co-ordination with a gravity or spring controlled air valve, satisfying apparently every ambition in gasoline matters, is not a solution of the kerosene problems, and, as respects spraying, becomes a farce, if there is a throttle that at irregular moments shifts the position of highest air velocity from point to point. More hopeful is the outlook if the air valve also forms the main control throttle, for in this case, while the valve is seated at low speed and no load, all air can be caused to flow past the jet as in Figs. 23 and 25, by means of suitable tubes, holes and ways in and around the air valve or along bypasses. Obviously, too, as piston speed increases, a constant air rush can be maintained, if the area of the entry for spraying air be increased in suitable proportion, so that rising venturi tubes, adjusting themselves automatically, operated by the main air valve or connected to suitable throttle device, are promising, or, at least, worthy of careful review with laying down the main lines of design for oil engine feed, but it must be noted carefully how the advantages may be lost by unsuitable throttle design. Strangely enough, many of the most promising designs are incorporated in gasoline carburetors, leading one to wonder whether their inventors have ever thought to add

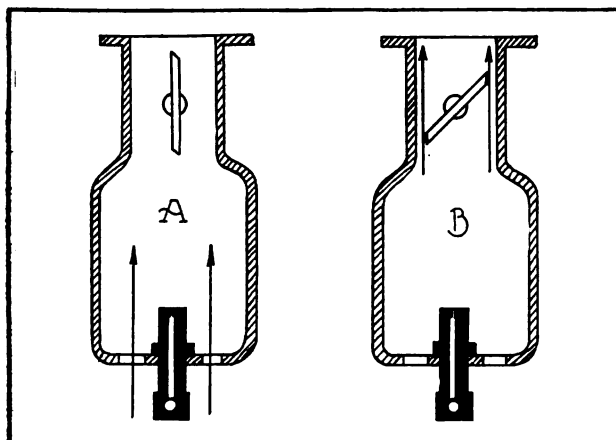


Fig. 22—Flow of Air in Throttle Carburetors: A, Highest Velocity with Throttle Open; B, Velocity Removed to Edges of Valve as Indicated by Arrows.

fectiveness of the fuel spraying is a measure of the impact. In the standard designs of the butterfly throttle, when the valve is nearly closed, the high speed air current is found rushing in between the edges of the throttle and the adjoining walls of the induction pipe.

### Air Velocities.

In Fig. 22, being diagrammatic sections of a carburetor, at A, with open throttle, the highest air velocity is near the jet; at B, with nearly closed throttle, the point of highest air velocity is removed to the edges of the throttle valve, as indicated by arrows. Taking advantage of this obvious fact some gasoline carburetor designers have opened a bypass pipe connecting a flue from about the position where the edge of the throttle disc touches the wall, to a special small jet. As a consequence the engine at low speed obtains an effective supply of pulverized fuel. Some designers have arranged a throttle valve on the atmosphere side of the carburetor so that on closed throttle the full value of "negative pressure" originated by the induction stroke of the piston may be gained, more or less on the idea shown diagrammatically at Fig. 23, where a sleeve valve is utilized, having a rising air valve so that when this is sealed, spraying air



a vaporizer and test the effects of the apparatus with heavy fuel.

#### Location of Jets.

Having, say, improved the design by attention to the effect of throttle control, we may pass to the examina-

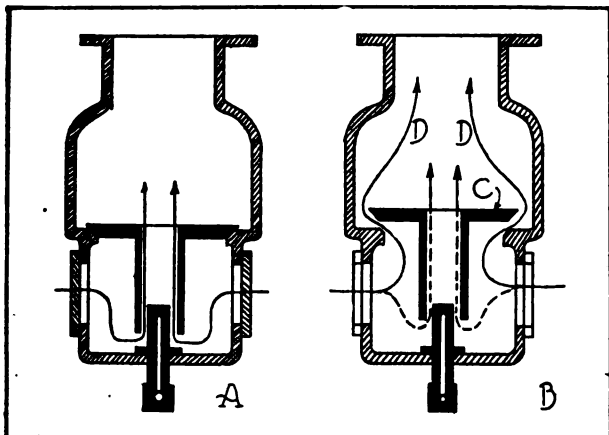


Fig. 23—Sleeve Throttle with Rising Air Valve—When Valve Is Sealed Air at High Velocity Passes Jet as Indicated by Dotted Arrows, the Main Air Entering at Holes in the Sleeve.

tion of the actual spraying device, which cannot be neglected in considering throttle control problems. We believe the flow of air, as in Figs. 22 to 25, parallel with the axis of the fuel jet, to be fundamentally incorrect. That which we desire—which indeed we must obtain—is fine spray, and we should seek intelligently to apply natural forces. If we are correct in assuming that plus frictional and tensional factors the efficiency of spray making is a measure of the kinetic energy in the air blast, then a jet crossed at right angles as at Fig. 26, must be greatly superior to the vertical jet with vertical air blast. The cause of the fuel emergence is negative pressure so-called. Neglecting frictional resistances, the greater the negative pressure the higher the liquid fuel will jump out of a nozzle when the engine piston makes its induction strokes as diagrammatically put in Fig. 27. With closed atmospheric side throttle, coarse particles of the fuel are sucked vigorously out of the jet nozzle. It is the blast of the air that effectually sprays as shown at the right in Fig. 27.

#### Negative Pressure a Factor.

Although the negative pressure may be transformed into air rush, yet the impact of the air delivers a very different blow and gives very different spray than where it meets fuel particles tending, by their velocity of emergence, to maintain their position relative to the axial direction of the jet as in Fig. 26. In this case the actual energy may be considered to approach the theoretical, while if other forces, frictional and tensional, enter into fuel pulverization, these must increase the breaking-up effect. The vertically disposed jet with parallel air flow is convenient in practical design and construction. This, no doubt, has contributed to its general adoption. A concentric choke tube fits neatly and compactly as in Fig. 23; whereas, to arrange a jet as in Fig. 26, at right angles to such a tube, is not so convenient. And it is certainly awkward when we may seek to arrange a movable tube in order that this may adjust itself automatically, or, by suitable connection to the throttle, vary the area of airway immediately next the spraying jet. On the vertical, parallel system such variable choke tubes may be arranged, but where right angled pulverization is adopted the tube apparently needs slotting for the jet and this may lead to constructional difficulties. Moreover, vertical line of movement is suited to co-ordinated air control and taper needle and not suited to horizontal arrangement.

#### Gasoline Design Favors Taper Needle.

Present practise in gasoline carburetors largely favors the taper needle in the fuel jet, as in Fig. 24. Seeing that the greater the air velocity the larger the hole for fuel emergence that can be employed effectively for

the production of fine spray, the taper needle has its merits and is certainly a very practical device, for when the needle is lowered, the annular slot formed is very narrow and so suited to the production of fine spraying with a possibly reduced air velocity. The aim, however, of the designer dealing with taper needles connected to air control valves and having venturi tubes should be to maintain a constant air velocity irrespective of engine piston speed. The general idea is plainly feasible and has indeed been adopted in gasoline carburetors, for the jet nozzle being stationary, if the rising air valve, needle and choke tube move in unison as in Fig. 25, this may be arranged so that a measure of constancy of air blast is attained opposite to the jet nozzle, but, as we have pointed out, it is waste of energy to be at pains to plan on these lines if the whole action is to be spoiled by an ordinary butterfly throttle valve between the carburetor and the engine.

#### Value of Effective Pulverization.

In matters like the present the infinitely small is of importance. Current ideas of designers as evidenced around about the spray nozzle of carburetors will bulk as a very gross expedient in view of those who have devoted much attention to the several points concerned. Nothing shows this more plainly than the design of jet nozzles, where the utmost refinement of idea based on correct theory and carried out accurately, in accordance with this in practise, should be the aim. The errors in design of such infinitesimally small matters are referable to the want of appreciation of the value of pulverization, and to the aiming solely at correct mixture for varying engine speeds, irrespective of the spray quality. The theoretically correct method must be considered to be a jet so arranged, so designed and disposed that the air sweeps unobstructedly across the fuel emergent slots as in Fig. 26. Even in the case of parallel air flow we frequently see careless design, whereby ridges or prominences of not wanted metal create whirls and eddies, and obstruct the desired arrow-like flight of air particles directly across the slots. Again, assuming our fuel pulverization theory correct—that it is the kinetic energy in the air particles that breaks up the liquid—we cannot do better than hold in mind the glass ball of a shooting gallery where obviously a clean, straight shot delivers a more effective blow than when the projectile ricochets, or—if we can imagine such a thing happening—curves around to right angles. Taking another view, we want to put the object to be battered squarely upon the anvil, directly under the hammer—all sufficiently obvious, but needing some persistence in advancing and arguing, because of the prevailing want of appreciation of the significance of fine and constant spraying for variable speed oil motors.

The end is not easy of attainment with vertical jet

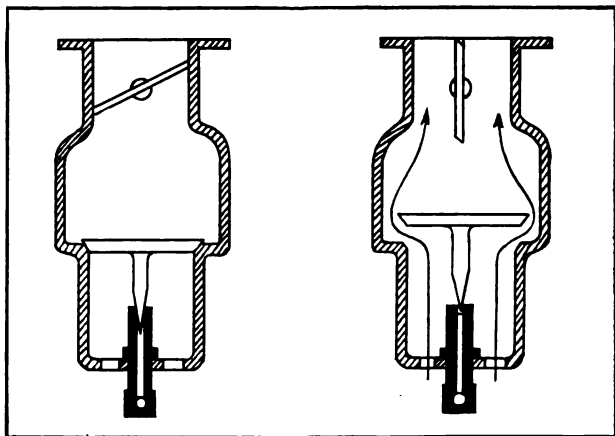


Fig. 24—Showing Design with Air Control Valve Connected to Taper Needle in Fuel Jet.

and parallel air flow. In Fig. 28, being diagrams of vertical jet nozzles with parallel air flow, any fuel particle, as A, emerging from the jet within such an area as indicated by the semi-circle, must be shielded from direct air impact, and this in theory applies also to any parti-



cles within the distance C. No doubt turbulent eddies above the jet bring out particles of fuel as D D, directly subject to the pulverizing air blast, as indicated by the

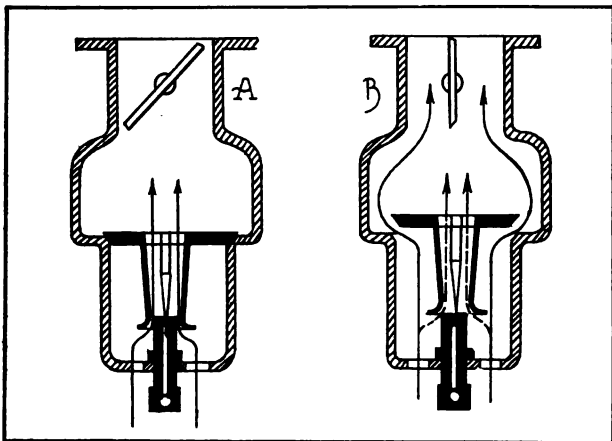


Fig. 25—Design with Main Air Valve Carrying Movable Choke Tube, Restricting the Airway at Low Speed Around Jet as at A, Augmenting Supply at High.

arrows B B; but theory suggests side emergence as at E E.

The principle of the rising air valve with taper fuel control needle is that, given a butterfly throttle valve between the carburetor and the engine, as the throttle opens and negative pressure increases the air valve rises on its seat, permitting more mixture charge to pass at the same time, and adding more fuel by reason of the corresponding rise of the taper needle in the fuel jet. The main idea is mixture—its proportions—and so far the idea is useful. As petroleum engine designers we must study such devices in the light of our belief that the spraying, as far as possible, must be constant. In choosing any such device for a carburetor or oil engine feed we must study the resultant air flow and seek to arrange that, while our mixture is correctly proportioned, it is also of desirable quality.

#### Varying Air Velocity.

The obvious and gross defect we have pointed out is that the butterfly throttle valve situated between the carburetor and engine inlet valve dominates the whole resultant action and effects. If we have an open throttle valve the highest air velocity passes the jet as in Fig. 22, and the next moment, with nearly closed valve, sees the greatest air rush past its edges as at B, Fig. 22; the position of high velocity has changed, and so it ebbs to and fro. It is not what we require, and, if we can do no better, we can at least arrange a bypass from jet to throttle edge to ensure a good spray during light running.

The designers of kerosene carburetors will do well to study this point. In doing this they must for the time put aside mixture proportions and concentrate attention on air velocity, and attempt some arrangement of choke tube and the like that will enable constant speed of air to be obtained past the jet nozzle. With any given piston speed and size of opening in induction pipe, neglecting the variation with varying crank angle, the air flow is the piston speed, the effectiveness of the air flow for pulverization is related to the square of the speed, for which reason in a rough diagram in the preceding chapters on variable speed oil engines we sketched the curves for spray character greatly in excess of altitude of that for piston speed.

#### Effective Fuel Emergence.

The substitution of a throttle device on the atmospheric side of the carburetor, if applied intelligently, may be helpful. It has been adopted both for gasoline and kerosene. In the diagram Fig. 23, assuming the throttle valve well fitted and closed, the full value of negative pressure exists at the jet, causing effective fuel emergence, but we must keep distinct the notion of "negative pressure" and its effects on one hand, and a high air velocity on the other. The one "sucks out", the other sprays the fuel, and both effects may be employed bene-

ficially, but a high degree of this negative pressure is not necessarily beneficial. We desire in preference high speed of air. In experimenting with fuel vapor pump engines the distinctive effects of the two actions were well demonstrated to the writer.

#### Character of Spray.

Negative pressure—suction—is one thing as it affects fuel spraying; high velocity of air is another. The first is in reality of little service for pulverization. It causes fuel to jump energetically out of the jet nozzles (Fig. 27), and frictional and tensional forces alone act to disintegrate the fluid; but anyone who has carefully investigated the character of the spray emerging from the earlier type of gasoline carburetor, knows that "spray" is here a misnomer. Lumps, so as to speak, of fuel are torn away. The resultant supply of fuel which passed muster in old days, and still does now, may suffice, for crude carburetion with a volatile fuel. It is useless for the variable speed, variable load engines. When, therefore, we decide to put our throttle on the atmospheric side of a kerosene carburetor, we need to remember this distinction between the effects of "suction" on jets and vigorous rush of free air particles across them as in Fig. 27, and as we consider a vastly superior method in Fig. 26.

The arrangement, therefore, that we have assumed in Fig. 27, causes powerful fuel emergence on closed throttle, and from our point of view is useless. The design must be modified to convert the forces at command into kinetic energy of air. The existence of powerful suction, or negative pressure, is good so far as something potential in the hands of the designer that he may adroitly convert into air rush. We need a certain amount of suction power to cause the fuel to emerge, or perhaps to assist it to emerge, since the mere rush of air at right angles over a jet of itself acts to cause the liquid to flow.

#### Design of Fuel Ways.

The efficiency of suctional forces in spraying are related to the size of the slots or holes for fuel, the coarse hole creating a more or less solid stream of fluid; the fine holes setting up frictional resistance and reacting in surface-tensional forces give us a finer spray; so it would appear that before we can design fuel ways intelligently, that is, in the jet nozzle and the actual spraying holes or slots, we must gain some clear idea as to the relative amount of negative pressure and of actual air velocity created in the induction stroke under different conditions. A jet in an induction pipe with closed atmospheric side throttle valve as at Fig. 23, does not spray except by virtue of certain resistances to the drawing-out action excited by negative pressure upon the surface of the liquid at the jet. Gasoline designers generally ignore the point, but should the same be done with petroleum we may get an engine with good points in starting away, for example, but much smoky exhaust will result necessarily. If, therefore, we condemn the inter-engine-and-carburetor butterfly throttle and decide to substitute a control on the atmospheric side, we must see to it that the forces thus at our disposal are rightly disposed, which means, generally, the conversion of minus pressure into positive kinetic energy. Otherwise, if we completely ignore facts, we might flood the cylinder with a

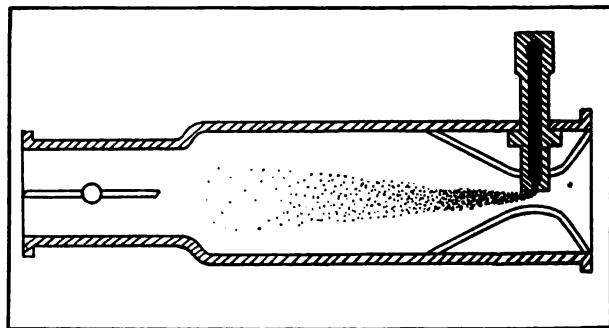


Fig. 26—Jet at Right Angles to Tube.

liquid fuel each time we throttle the engine.

The problem before the designer is, therefore, to arrange choke tubes and air way details so that he may



get the full effect of his rearranged throttle position in vigorous air blast, and he must arrange the valves, either automatic or inter-connected with the throttle, so

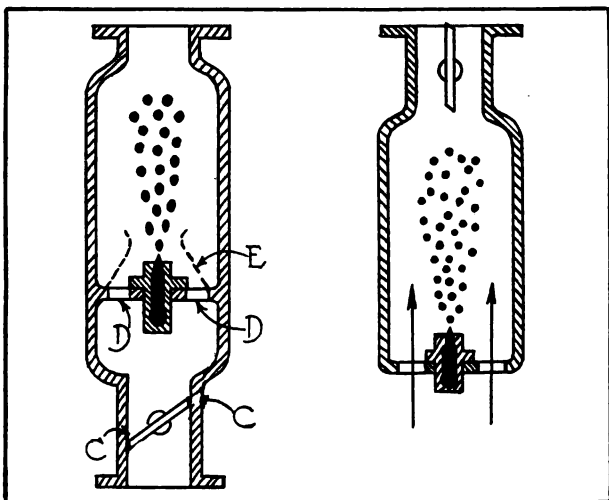


Fig. 27—Fuel Emergence from Jets, Due to Negative Pressure: At Left, Coarse Particles as with Closed Throttle; at Right, Effect of Air Blast.

that as great a constancy as practicable is insured in this blast. Sleeve throttles may be found convenient, and generally it is to be remembered that, what with this and piston and rotary shaped blocks, ways of varying volumetric efficiency in motor cylinders exist other than the not remarkably scientific practise of fitting a sheet of oval metal into a pipe. In some designs the main air control valve may be constituted the throttle. Perforated sleeves admitting air to a mixing chamber may be a useful recourse, while piston blocks may be made to slide over openings and so form a useful main idea of throttle valve.

#### Constancy in Air Spraying.

The problem of ensuring that desirable constancy in air spraying velocity at all engine speeds seems attainable most simply by a movable choke tube, as in Fig. 25 A and B. At lowest engine speed the tube, of, say, the venturi type, closes down on the jet, or leaves but a very small air way, yet, even throwing over the old butterfly throttle and substituting some device on the atmospheric side of the carburetor, we can see we are upsetting arrangements with our supposed improved means of control. On every side we can only see compromise and give and take, while the principle of varying the cylinder charge by restraining its free entry is included as fundamental, for, if we design something that shall move up and down, as a tube around the jet, and so leave a proportionate air way that we may calculate will give us a constancy of velocity independent of piston speed, whether we restrict the intake pipe forward or aft of the carburetor, the principle governing our arrangement is set at nought.

#### Location of Throttle.

We have by putting our throttle in the new position, gained enormous power over the indraught; that is, we can control and make vigorous the air rush. Yet the act of controlling the engine by this device must, if this includes restraining free air entry, alter velocities at the jet. Viewing matters from our present standpoint we may look upon the principle of making the main auto valve the actual governing throttle as hopeful, for, if the increase of the opening of the throttle—which is here the air valve—co-ordinates with the movement of the needle, and with the needle moves the venturi tube, the opening of the throttle and increase of the potential energy supply for spraying may be modified by the rise of the tube, whereby its wider diameter comes over against the jet as in Fig. 25. In this case the area of the air passage is increased and compensation made for the increase of air flow to the cylinder, but the more we study the whole position the more evident it becomes that we must design for a compromise, and that the

statement made that this and that carburetor maintains a constant air velocity past the jet is proved, not justified, by the mere presence of ordinary throttle control, which, while shifting the point of high velocity to the throttle valve, dams up the air behind and lowers the value of the air rush through the choke tubes and past the jets.

#### Effects of Engine Side Throttle.

The diagrams at Fig. 29 show a carburetor with engine side throttle in three positions—A, nearly closed; B, half, and C, fully open. In conjunction with Fig. 22 A, it may be useful as bearing generally upon our considerations. We may assume the presence of a choke tube directing the air around the jet nozzle, but the air openings remain constant. At nearly closed throttle we get, in Fig. 29 A, little fuel badly sprayed; at B, an increase of fuel, with improvement in quality; at C, most fuel and a fine spray. The approximate air speed is assumed proportionate to the length of the arrows. At A the highest velocity is at the edges of the throttle, and under these circumstances our potential fuel disintegrating force is wasted. Air behind the throttle is penned, as water behind a dam, the rush over the weir being comparable to that past the throttle valve. The air entering the carburetor is necessarily slowed where and howsoever we make the openings, and obviously so in the diagram, where we have assumed the inlet sufficient in area for the engine at full power and high speed. Negative pressure is low, hence the pump action is small. Less fuel therefore emerges and cannot be well pulverized, as the air rush past the jet is checked. Bringing the position under review, and taking into account the several speeds of air and the relation between this and suctional forces, and assuming a constant piston speed, it is plain that more fuel better sprayed enters at B, and that these favorable conditions still further improve at C.

#### Negative Pressure vs. Air Rush.

All this is sufficiently elementary, and the position, as respects quantity of fuel, is long recognized, being made basic in constant mixture carburetor design. The neglect, as concerns petroleum motors, is failure to note (a) definite distinction between the force termed negative pressure and the actual air rush, and (b) the effect of these forces upon the quality of the spray.

In Fig. 27 we have suggested even a better spray, that would actually result in practise, for, if as indicated, we completely close an atmospheric side throttle, the engine becomes a pump purely, and would draw out a solid stream of liquid were the jet sufficiently large. As the jet area is reduced, certain forces tend to break up the fluid, the whole principle upon which drops are formed being much like that concerned when we turn off a water tap so that the solid stream is broken. Such action may pass in carburetion with a volatile fuel and is much like that which, in the early days of the gasoline carburetor, we brought about by placing an obstruction

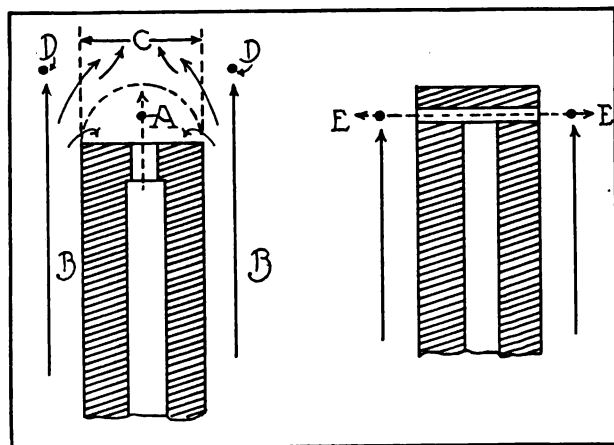


Fig. 28—Effects of Vertical Jet Nozzles with Parallel Air Flow.

in the inlet pipe, in our endeavor to start a refractory engine. The inventor, therefore, who suddenly discovers the potential benefits of atmospheric side throttle valves,



may accomplish nothing great unless he can, by ingenious design, convert the forces he has commanded into others of suitable character. Strictly, the position indicated at Fig. 27, with air-tight induction pipe, throttle, cylinder and piston, is impossible in engine operation, because it simply indicates drawing in liquid fuel as such, without air for combustion. Nevertheless, as we have before suggested, the main principle applied intelligently, with suitable details, seems promising in kerosene carburetor design.

#### Varying Throttle.

It should again be noted that if we commence to open the throttle of Fig. 27, the highest air velocity—the most effective blows of our fuel breaking hammer—will be at C C, and remain at that position until the way opened at the throttle is at least equal to that of the ways D D, about the jet. Again, the highest velocity will then be at the openings D D, and not where we require it, until a choke tube as indicated at E is added, and there yet will remain a deficiency in practical application of these desires (powerful "atomization") for reasons suggested in discussing diagram Fig. 28. Having fully opened the throttle in Fig. 27, given equal conditions about the air inlet and choke tube, the effects of the arrangement in both sketches are identical, or practically so.

The divergence in the resultant effects in positions Fig. 27 and Fig. 29 A should be noted. Assuming both to have slightly open throttle valve, Fig. 27 results in a very rich mixture being drawn into the engine, but the

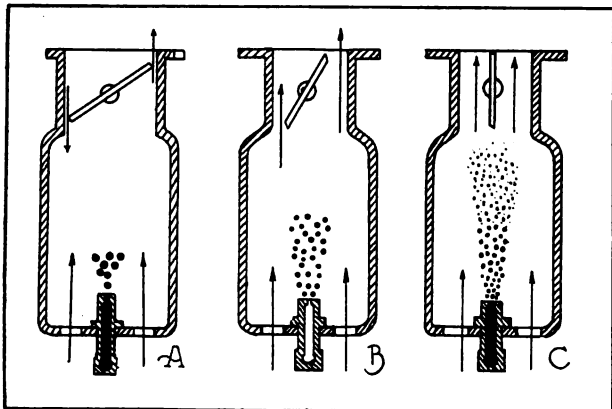


Fig. 28—Showing Spray Obtained with Carburetor on Engine Side and Throttle in Three Positions: A, Nearly Closed; B, Half; C, Fully Open—The Approximate Air Speed Is Assumed Proportionate to the Lengths of the Arrows.

object of throttling is to reduce power so the accepted method of the principle of Fig. 29 A, seems rational, as reducing fuel synchronously with reduction of compression. It is defective, as lacking power of fuel educting, but modern design meets this in gasoline carburetors with valves, etc., closing the main air way and leading air past the jet as in Fig. 25 A, where, however, the engine side throttle prejudices the value of the air rush at the nozzle. In Fig. 23, with atmospheric side throttle, the relative value of negative pressure and kinetic air energy will be according to the detail design of the air ways and choke tube area at low speed, as at A; and when as at B, at full power the main air control valve C lifts, air is shunted at D D, and a suitable velocity may possibly be obtained up the choke tube past the jet, and similarly in Fig. 25 B, the several effects, however differentiating because of the divergence in the principle of throttling. There is possibly something to be accomplished with the compound system of throttling; that is, both below and above the carburetor, co-ordinating and working harmoniously in accord with true principles.

#### Effects of Varying Throttle.

Fig. 29 is intended to represent varied throttle at constant piston speeds. If this condition ruled at all times—if, that is to say, carburetors were required only for variable load, constant speed engines, such as is the duty for all stationary engines, excepting virtual toys, we might make a fair approximation to a means of main-

taining constant quality of spray, allowing for the fact that all slow speed engines spraying by action of motor piston no doubt "dribble" at each dead centre crank position, when the value of the air flow in the induction pipe is zero.

But in automobile engines we have the complication arising from the compound action of throttle plus piston speed. The pace of the engine varies not only involuntarily from load, but designedly by the act of the car driver. If, therefore, Fig. 29 B represents a certain position of throttle valve and a certain speed, without change of throttle, varying piston speed may witness a degeneration of the spray to condition A, or an improvement to condition C. Even if we ignore the effects of varying compression temperature on the charge, the complication of load, speed and the varying demand for fuel, makes up a total of conditions to be met prompting one to believe that only in independent feed or independent air blast can we look for a complete cure of the evils attendant upon varying spray quality in automobile oil engines. The complicated factors here entering no doubt present a fine field for ingenious invention, but it seems quite certain that with auto spraying engines, subject to varying piston speed controlled by restricting the amount of the charge, a compromise only can be the end of design, and the only way which engines can be provided with absolute constancy of spraying air, is by some independent system of feed, which means apparently engines designed de novo—high speed heavy oil engines, integrally such, in lieu of carburetors attached to engines of the gasoline type.

#### Difficulties of Designers.

As some encouragement, considerable advance has been made, and more may be attained. It is commendable that so much has been effected; for when we review and endeavor to bring into harmonious correspondence all the factors bearing upon the problem, they seem too inextricably acting and counteracting, the one against the other, to look for complete success with valves either auto operated or hand controlled. The sum of the effects of variable piston speed plus throttle control presents a formidable obstacle.

Supposing we had an engine running at full volumetric efficiency, even if the speed varied we could solve the problem, nearly. This means eliminating the throttle—an impossibility in fact, but the theoretical consideration of the point indicates that, under these conditions, a very near approach to constant spraying could be made. To set out in detail the whole of the factors to be met where compression is varied and where varied speed prevails is somewhat discouraging to the inventor; but it is the correct and necessary preliminary if we would make an honest effort to meet the problem under the exigencies of accepted present day engine control.

Men interested in the manufacture of the new carburetor invented by H. O. Craven of Schenectady, N. Y., held a meeting recently to discuss plans for placing the new invention in the market. Besides Mr. Craven, those present included Joseph A. Field of Schenectady, A. H. Wynkoop of Philadelphia and Mr. Haines of Atlantic City, N. J.

The representatives of only two countries took part in the fifth international aeroplane race for the Gordon-Bennett cup, at Rheims, France, recently. As a result the trophy is retained by France, it having been won by Maurice Prevost in a Deperdussin monoplane, who covered the 124.28 miles in 59:45.6. The other contestants were: Emile Vedrines, France, Ponnier monoplane, 1:00:51.4; Eugene Gilbert, France, Deperdussin, 1:02:55.4, and Albert Crombez, Belgium, Deperdussin, 1:09:52.



## RHODE ISLAND'S MOTOR SHOW.

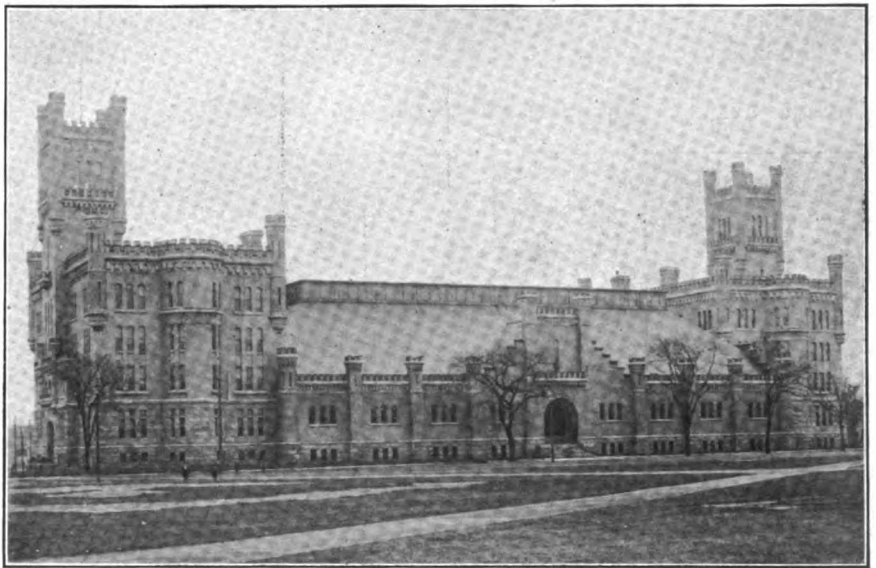
### Providence Dealers to Stage First Display of 1914 Models in the East.

The Rhode Island Automobile Dealers' Association has stolen a march on Boston and New York by deciding to hold its annual motor show in the state armory at Providence, R. I., Nov. 22-29, during Thanksgiving week. This early date assures the people of New England and the East an excellent opportunity to inspect the 1914 offerings well in advance of the so-called big shows. Manufacturers are not slow in appreciating this fact, and it is anticipated that several new makes of machines will be seen for the first time at any exhibition in this New England display.

Percival S. Clark has been selected by the association as general manager, and he will be assisted by a show committee. Already, arrangements have been made to include a larger number of dealers than ever before and to make the exhibition representative in every respect. L. F. Pease & Co., Providence, and the C. H. Koster Company, New York City, will have charge of the decorative treatment.

At the rear of the main floor will appear a mammoth painting in water colors on oiled silk, 37 feet high and 150 feet wide, imported from Japan at a reported cost of \$10,000. This will depict a Japanese scene and form the background for the entire decorative scheme on this floor. The side walls will be covered with green bunting, above which will run a border of wisteria, and suspended decorations of pale blue will be draped over the entire hall, underneath which will be hung Japanese lanterns and banners, branches of cherry blossoms, etc. The floor will be covered with burlap in two colors, red and green, while potted plants and palms will mark the corners of the space divisions. The spaces themselves will be designated by special emblems embodying the regulation automobile road sign. Nothing will be permitted to detract from a clear view of the entire display from the entrance, thus bringing out the size of the hall to its best advantage.

The main floor will be devoted to pleasure cars, while the basement will house the commercial vehicle and accessory exhibits, and all departments will be treated in a manner to carry out the general decorative scheme. In contrast with former practise no dealer will be permitted to occupy more than two spaces along the desirable centre aisle, with the result that instead of 12 or 13 exhibitors in this section there will be at least 24. The restriction will not apply to the side spaces, however, and one concern already has reserved 10 of these for a fitting presentation of the lines handled by it. Were it possible to secure a separate building for the trucks, the problem of assigning space would be simplified somewhat, but sufficient applications have been received to indicate that this will be by far the largest show-



The State Armory, Providence, R. I., Where the First Showing of 1914 Models in the East Will Be Held During Thanksgiving Week.

ing of motor cars that New England has ever seen, outside of Boston.

The United States government, through the War Department, has purchased a 1914 Cadillac for the use of the Chickamauga-Chattanooga national park commission. Not only is this a compliment to the maker, as it was selected in competition with numerous other makes, but it shows that the government is overcoming its reluctance to open federal parks to the automobile.

At the meeting of the New York Garage Owners' Association, New York City, means were discussed for fighting the test suit against the installation of separators ordered in all garages by the fire department.



## IN THE REALM OF THE MOTORCYCLIST.

### Fifty-Mile National Amateur Championship Race for Bosch Trophy to Be Held in Cleveland---Chicago Show Plans Completed---Contest Results and Club Notes.

**C**HAIRMAN John L. Donovan of the competition committee of the Federation of American Motorcyclists has been experiencing some little trouble in securing an opportunity to run off the 50-mile national amateur championship race, which will complete the series for the 1913 Bosch trophy award. Originally, it was expected that this event would be held in Brooklyn, N. Y., in connection with the birthday celebration, but when this plan failed to materialize an effort was made to select a suitable track under other conditions.

The lack of time, the racing season being near a close, has been an important factor. The rules provide that 30 days' notice must be given. Mr.



**Pioneer Milwaukee Woman Rider Selects Flying Merkel.**

Donovan complied with this provision in awarding the race to the North Shore Motorcycle Club of Chicago. Soon afterward that club notified him that it could not stage the event, and the sanction was transferred to the Cleveland Motorcycle Club, which will run the race at the North Randall track, Oct. 26. Under the circumstances it is believed that Mr. Donovan's actions will meet with approval. As there are but three or four riders eligible for the event, these have been notified personally, well in advance, of the change in date and place.

#### **Ready for the Show.**

Everything is in readiness for the second annual national motorcycle, bicycle and accessories

show in the Coliseum at Chicago, Nov. 3-6, and there is abundant evidence this will prove the biggest event of its kind ever held. The list of exhibitors shows a total of 104, included among which are practically all manufacturers of motorcycles, and a splendid representation of those who produce or market accessories and fittings for the two-wheel mount.

#### **She Rides a Merkel.**

The Flying Merkel agent in Milwaukee, Wis., says that the young woman shown in an accompanying illustration is one of the pioneer women riders in that city. So anxious was the agent to secure the order that he induced the Miami Cycle & Manufacturing Company, maker of this line, to produce a special machine, on which the saddle post was dropped 1.5 inches and the pedal crank was shortened so she could reach the pedals at the lowest position. Incidentally, 26-inch wheels were fitted instead of the regulation 28-inch members.

#### **On Long Distance Runs.**

I. H. Silsby, manager of the Silsby Company, Cleveland, O., riding a 1914 two-speed Yale twin, and Carl Sieler, chief mechanic, riding a self-starting Flying Merkel twin, left early in the month for a run to New Smyrna, Fla., on a vacation tour.

Ralph Piper, Corning, Ia., has recently completed a 2000-mile trip to the Cheyenne reservation in North Dakota. He made the journey in 10 days, with 290 miles the highest distance covered in one day. The feature of Piper's trip is that he covered the entire distance on an average of 80 miles to a gallon of gasoline.

When Mr. and Mrs. Leroy Snodgrass of Los Angeles, Cal., arrived in New York City a few days ago they had completed what is said to be the first coast-to-coast sidecar trip ever made in American motorcycle history.

Claude W. Baskin, Steelton, Penn., recently made a trip of 7000 miles with a cost of repairs totalling but \$1.81.

William Powell, Chicago, in a recent economy test rode his motorcycle 161 miles on one gallon and 3.5 quarts of gasoline.

Alexander M. Inderbitzin has returned to New York City after an 8000-mile motorcycle tour of England.



### New Merkel Agencies.

John Grove, Pittsburg, Penn., is to handle the Flying Merkel machines, made by the Miami Cycle & Manufacturing Company, Middletown, O., during the 1914 season, and Coleman B. Long, Louisville, Ky., has contracted to handle the Flying Merkel in Louisville and surrounding territory hereafter.

### Recent F. A. M. News.

John L. Donovan, Chicago, chairman of the Federation of American Motorcyclists' competition committee, has appointed the following state referees: Indiana, J. H. Kinney, 232 North Illinois street, Indianapolis; Illinois, Capt. Frank E. Yates, 3518 Ellis avenue, Chicago; Kansas, Erwin Keller, Topeka.

The board of directors will hold a meeting in Chicago, Nov. 5, during the progress of the Chicago motorcycle show, at which matters referred to it by the Denver convention will be taken up. The federation will maintain headquarters at the Coliseum throughout the four days of the display.

C. W. Waughop, St. Louis, Mo., one of the new directors of the F. A. M., is making an extensive motorcycle tour of the country. At the last report he had covered 11,000 miles, visiting practically all the important cities east of the Rockies. While now in Florida, Mr. Waughop will ride back to Chicago in time to attend the motorcycle show and then go to New York City.

The following local commissioners have been appointed recently: Middlesex county, N. J., Arthur LaRoe, Perth Amboy; Ashtabula county, O., J. C. Moran, 13 Spring street, Ashtabula; St. Lucie county, Fla., R. A. Saeger, Ankona.

New registered repair shops have been announced as follows: Gus Bourg & Son, Roseland, Neb.; Ravenswood Cyclery, 4501 Lincoln avenue, Chicago, Ill.

### Merkel's Bosch Magneto Contract.

The Bosch Magneto Company, New York City, has received the 1914 contract for the entire magneto requirements of the Miami Cycle & Manufacturing Company, Middletown, O. Although the exact quantity to be delivered has not been stated, it is believed that it will be a larger number than was used on the 1913 Flying Merks.

### Charles Miller, Factory Manager.

It is explained by the workmen in the motorcycle department of the Miami Cycle & Manufacturing Company, Middletown, O., that there is no more popular man at the head of any factory organization in the country than Charles R. Miller, factory manager. Perhaps the accom-

panying illustration will go far toward indicating the truth of this statement, but it may be added that last summer he thought he would resign to go into the retail business. His presence was missed so much at the factory that he has heeded the request of employer and workmen that he return to his old position.

### Club Notes, Here and There.

The Winsted Motorcycle Club has recently been organized at Winsted, Conn., with the following officers: President, Raymond Allen; vice president, James F. Ryan; secretary and treasurer, W. S. Fancher.

A. J. Preussner of the Galveston Motorcycle Club, Galveston, Tex., finds that though he has but one hand it is no handicap to him in operating his machine. In fact he is considered one of the best riders in Galveston, taking part in long runs and races of the club and frequently returning the winner.

Several members of the St. Louis Motorcycle Club will ride to Chicago to attend the show next month.

The Wanderer's Motorcycle Club, Toronto, Can., is planning a three-day endurance run during Thanksgiving



William Samuelson, Well Known Pacific Coast Rider, and His Indian Mount.

week and many new features are promised. A number of valuable prizes is offered.

Of the 44 starters in the recent reliability run of the Omaha Motorcycle Club, 22 finished on schedule time, of whom 11 secured perfect scores.

Joseph Esler, president of the Quincy Motorcycle Club, Quincy, Ill., is planning a motorcycle tour of Japan and China next year.

In the recent run of the Atlantic City Motorcycle Club, Atlantic City, N. J., to Allentown, Penn., and return, William F. Specht, Jr., and Frank Sykes, Harley-Davidson riders, had perfect scores.

Out of 35 starters in the recent two-day endurance run of the Toledo Motorcycle Club, Toledo, O., 33 finished on schedule time. The run was for 367 miles.

In the recent endurance run of the club in Tacoma, Wash., covering 204 miles to Hoquiam and return, seven of the riders secured perfect scores, as follows: H. E. Jameson, Harley-Davidson; Roy Hearne, Harley-Davidson; Elmer Bergstrom, Flying Merkel; E. Brennan, Indian; D. Oakes, Dayton; Henry Long, Excelsior; Merlfin Finch, Yale.

The Christmas Day event of the Savannah Motorcycle Club will have "Grand Prize Professional Motorcycle Road Race" for its official title. The distance will be 303.75 miles, or 27 laps of the course, open to riders of all



unported machines, singles or twins, 61 cubic inches or less in displacement. In addition to the grand prize trophy the first prize will be \$500, second \$250, third \$100. Up to Dec. 10 the entry fee will be \$10, thereafter, \$100.

After two postponements on account of inclement weather, the triangle run of the Providence Motorcycle Club, Providence, R. I., was held Oct. 19, with 40 of the original entrants starting. The riders left Providence in squads of four each minute, the first starting at 7 in the morning. The run was to Boston, to Worcester and back to Providence, and despite heavy and muddy roads good time was made. Thirty-three of the starters secured perfect scores. All who finished received medals, the trophies being awarded to those having perfect scores.

The fourth quarterly endurance run of the Cleveland Motorcycle Club was held last week with 15 entrants starting. Of the 15, five riders finished.

The annual Indian summer race of the Indianapolis Motorcycle Club was held last week at Shelbyville.

The Gadsden Motorcycle Club, Gadsden, Ala., has recently been organized and is to affiliate with the F. A. M.

The West Philadelphia Motorcycle Club has moved into its new, spacious home and is ready to welcome visitors at all times.

The Great Falls Motorcycle

Club, Great Falls, Mont., was recently organized. A membership of 42 makes the club the second largest of its kind in Montana.

### Recent Racing Results.

The following summaries indicate the results in recent race meets throughout the country:

#### Wooster, O.

Five miles, Wayne county riders only—First, Clarence Mowrey, Harley-Davidson; second, Orville Schmidt, Indian; third, Clarence Cohn, Flanders.

Ten miles, professionals—First, John Morgan, Excel-

sior; second, Paul Hale, Thor; third, Milton Long, M-M. **Norwich, Conn.**

Three miles, trial heat—First, Carroll, Indian; second, Steiner, Excelsior; third, Latham, Excelsior; time, 3:50.

Three miles, trial heat—First, Brown, Indian; second, Burdick, Excelsior; third, Pallazzo, Excelsior; time, 3:56.

Five miles, final—First, Carroll, Indian; second, Burdick, Excelsior; third, Steiner, Excelsior; time, 6:17.5.

Five miles, local riders—First, Floyd Ledger, Excelsior; second, W. N. Chapple, Indian; third, H. B. Baldwin, Excelsior; time, 7:27.

Three miles, trial heat—First, Carroll, Indian; second, Steiner, Excelsior; third, Latham, Excelsior; time, 3:46.

Three miles, trial heat—First, Burdick, Excelsior; second, Brown, Excelsior; third, Pallazzo, Excelsior; time, 3:53.5.

Five miles, final—First, Burdick, Excelsior; second, Steiner, Excelsior; third, Brown, Indian; time, 6:18.5.

Three miles, local riders, single-cylinder—First, B. P. Davis, Indian; second, T. M. Robinson, Indian; third, Cummings, Excelsior; time, 5:05.5.

Seven miles, open—First, Burdick, Excelsior; second, Brown, Indian; third, Walsh, Indian; time, 8:15.

#### Bay City, Mich.

Three miles, singles—First, James Kinsey, Jefferson; second, Young, Jefferson; third, Joseph Kinsey, Breed; time, 4:18.

Three miles, twins—First, Delzell, Indian; second, Phelps, Indian; third, Leix, Thor; time, 3:58.

Three miles, twins, exhibition—First, Hauer, Indian; second, Bell, Excelsior; third, Young, Indian; time, 3:47.

Five miles, handicap—First, Kinsey, single Jefferson; second, Phelps, twin Indian; third, Long, twin Indian; time, 7:05.

Seven miles, handicap—First, Hauer, twin Indian; second, Bell, twin Excelsior; third, Long, twin Indian; time, 10:03.

Two miles, twins, exhibition—First, Hauer, Indian; second, Bell, Excelsior; third, Young, Indian; time, 2:30.

Four miles, relay—First, Hauer, twin Indian, and Kinsey, single Jefferson; second, George Ford, twin Harley-Davidson, and Boehm, twin Indian; third, Weismiller, twin Excelsior, and Bell, twin Excelsior.

#### Los Angeles, Cal.

Three miles, trial heat—First, Johns, Excelsior; second, Bennett, Pope; third, Basso, Flying Merkel; time, 2:48.

Five miles, open—First, Sawyer, Excelsior; second, Frank, Excelsior; third, Manasco, Indian; time, 5:17.

Six miles, stock—First, Bennett, Pope; second, Walters, Indian; third, Peck, Indian; time, 5:30.2.

Five miles, final—First, Johns, Excelsior; second, Bennett, Pope; third, Basso, Flying Merkel; time, 4:45.3.

Five miles, stock, private owners—First, Heffelfinger, Pope; second, Renn, Thor; third, Bell, Thor; time, 5:25.8.

Two miles, professional—First, Manasco, Indian; second, Frank, Indian; time, 3:01.

Ten miles, professional—First, Johns, Excelsior; second, Walters, Indian; time, 9:20.

#### Winnipeg, Can.

Three miles, novices—First, Pearson, Indian; second, Janzen, Indian; time, 4:49.2.

Five miles, amateurs—First, Janzen, Indian; second, Johnson, Indian; time, 8:16.

Five miles, amateurs—First, Bush, Merkel; second, Janzen, Indian; time, 8:08.

Five miles, stripped—First, Rennick, Indian; second, Cruikshank, Indian; time, 6:05.

Five miles, amateurs—First, Janzen, Indian; second, Johnson, Indian; time, 7:54.

Five miles, handicap—First, Bush, Merkel; second, Pearson, Indian; time, 7:33.

Three miles, professionals, handicap—First, Rennick, Indian; second, Cruikshank.

Ten miles, professionals—First, Cruikshank; second, Rennick.

Five miles, singles, stripped, trade riders—First, Fabian, Pope; second, Watkins, Harley-Davidson; third, Lewis, Pope; time, 6:05.5.

Five miles, twins, trade riders—First, Russell, Excelsior; second, Smith, Indian; third, McCarthy, Harley-Davidson; time, 4:56.

Two miles, sidecars—First, Walters, Indian; second, Middlemas, Thor; time, 3:10.

Five miles, twins, stripped, trade riders—First, Smith, Indian; second, Tomkins, Jefferson; third, McCarthy, Harley-Davidson; time, 4:50.8.



Charles R. Miller, Factory Manager  
Miami Cycle & Manufacturing  
Company.

Club, Great Falls, Mont., was recently organized. A membership of 42 makes the club the second largest of its kind in Montana.

## JOIN THE F. A. M.

which is the National Organization fostering the interests of motorcycleists along legislative and other lines. Cut this out, mail it, and you will get the reasons.

### E. M. ESTABROOK

Chairman Membership Committee Federation  
American Motorcycleists,  
BANGOR, MAINE.

Please send me the F. A. M. Booklet and all information interesting to prospective members.

Name .....

Address .....



**Motorcycles in Business Life.**

Charles Luder, Washington, Ind., has found the motorcycle to be very instrumental in helping him build up a paying business in his photographic work. He has frequent calls from family gatherings, picnics and various meetings, but he has never sought this class of work until recently on account of transportation expenses. This problem has been solved by the purchase of a machine which he has fitted with a box to carry his camera and incidental necessities.

The Citizen's Ice Company, Toledo, O., has a flying squadron of motorcycle riders, each one a foreman of a section of the town with about a half-dozen ice wagons under his direction. While he oversees the work of the men on the teams, the foreman also takes care of emergency deliveries, frequently carrying a small amount of ice on his machine to some customer who is in need of prompt service.

Fred W. Diehl, Piedmont, Cal., finds the use of the motorcycle to be very practical in his poultry business. Diehl handles principally eggs and dressed poultry and has attached a carrier on which he makes quick deliveries to his customers.

Louis Geyler, Chicago, Ill., with the aid of a motorcycle equipped with tools and repair kit, finds it possible to get, at a speed of 60 miles an hour, to the aid of Chicago automobilists whose cars are in distress. Mr. Geyler says that the new service is the most important factor in his garage business.

At Lafayette, Ind., the business men are finding the two-wheel mount to be the most practical investment they can make for their increasing trade. Two of the city newspapers have machines to aid the reporters in covering distant runs and for aiding the necessarily rapid work of the circulation department. Others in that city who have found the motorcycle to be a valuable aid in their business systems are four drug stores, a plumber, the telephone company and the police department.

**Mail Carriers on Tour.**

The national convention of rural mail carriers recently held at Evansville, Ind., was attended by motorcycle parties from all sections of the country.

**Whole Family on a Yale.**

Mr. and Mrs. Lewis W. Luder and two children of Caro, Mich., a small town about 100 miles north of Detroit, have been enjoying a 2800-mile trip on a Yale twin, made by the Consolidated Manufacturing Company, Toledo, O., fitted with a sidecar. Mr. Luder drove the machine, while Mrs. Luder occupied the sidecar, with the

two children in front of her on cushions. Strapped on the outside of the car was about 97 pounds of baggage. The route lay eastward to Buffalo, across New York State to Albany, thence to Pittsfield, Springfield and Boston, Mass., and finally to Portland, Me., which was made the turning point for the return journey.

**Chapple to Sell Dayton.**

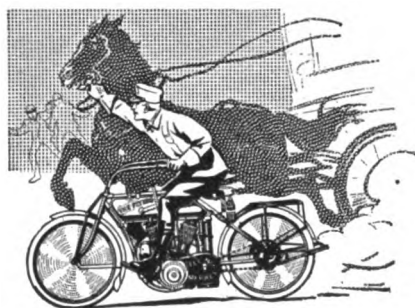
A. G. Chapple, one of the riding stars of the Brighton Beach track, has returned to the trade and is now travelling in the southern states in the interests of the Dayton motorcycle, made by the Dayton Sewing Machine Company, Dayton, O.

**On Transcontinental Journey.**

W. B. Gass and Joseph Palmer of Detroit are now on a pleasure trip on motorcycles riding from Detroit to San Francisco. They started from Detroit Sept. 15 and expect to arrive in San Francisco Dec. 15.

**Crawford Plant to Move.**

Announcement is made that the Midland Manufacturing Company, Saginaw, Mich., maker of the Crawford motorcycle, will move to Morgantown, W. Va. Buildings are being constructed in the latter city and it is expected that they will be ready for occupancy in a short time.



## **ALWAYS READY FOR ANY** **EMERGENCY!**

With its ability to pick up speed quickly—(60 miles an hour from a standing start within a city block)—the 1918 Flying Merkel Motorcycle is always ready for instantaneous use. These features and the fact that the Flying Merkel Motorcycle is the most economical in the world to operate has led to its universal adoption by Police Departments, Park Boards, Gas Companies, Telephone and Electric Light Companies and all other business concerns and individuals whose requirements demand a sturdy, reliable motorcycle at the minimum cost of upkeep. Remember, the Flying Merkel

**"Made Its Name on Merkel Mileage."**

Free Art Catalog on Request.

## **The Miami Cycle & Mfg. Co.**

320 Hanover St.

Middletown, Ohio, U. S. A.



# NEWS OF THE MANUFACTURER AND DEALER.

The following concerns have been incorporated recently to manufacture and deal in motor cars, accessories, etc.:

**American Motor Transit**, Camden, N. J.; \$100,000; L. J. Bergdoll, F. R. Hansell, F. S. Garman.

**Staunton Automobile Livery & Transfer Company**, Staunton, Va.; \$25,000; president, N. C. Williams; secretary, T. M. Hoopes.

**Stewart Transportation Company**, Perth Amboy, N. J.; \$2000; Walter K. Whitaker, Raymond S. Meyers and others.

**Wilson Engineering Company**, Buffalo, N. Y.; \$20,000; C. G. Hulbert, W. F. Gagnon, W. H. Pfeiffer.

**Automobile Realization Company**, Chicago, \$90,000; to deal in automobiles and accessories; A. B. Johnston, G. B. Smith, G. F. Matthis.

**Auto Salvage Company**, Kansas City, Mo.; \$12,000; Claude S. Peck, Bessie G. Peck, W. R. Chamberlain.

**Tire Buyers**, Guilford, Me.; \$600,000; to manufacture and deal in tires; H. Hudson, J. H. Hudson.

**Cleveland Motor Lamp & Radiator Company**, Cleveland, O.; \$10,000; to deal in motor car supplies; W. H. Montie, J. L. Balash, E. E. Kiesler, H. J. Monson, W. L. Ross.

**Automatic Safety Signal Company**, New York City; \$25,000; to manufacture and deal in lamp appliances; H. Sieglar, M. M. Becker, P. R. Feign.

**DeWitt Muffler Company**, Wilmington, Del.; \$30,000; to deal in parts; C. E. DeWitt, A. L. Downey, R. B. Rupert.



"Noon Hour" at the Factory of the Electric Storage Battery Company, Philadelphia, Showing About 1000 Employees Gathered at Allegheny Avenue and 19th Street.

**Warm-Hand Steel Wheel Corporation**, Poughkeepsie, N. Y.; \$150,000; to manufacture steering wheels; G. E. Smith, W. S. Barton, J. C. Barton.

**Spokane Motor Manufacturing Company**, Spokane, Wash.; \$50,000; E. A. Torrance, R. L. Dickerson and others.

**Arthabaska Motor Car Company, Ltd.**, Victoriaville, Que.; \$19,000; F. Bastien, J. O. Bastien, A. Quesnel, Jr., W. Bergeron, L. P. Crepear.

**Whiting Motor Car Company**, Philadelphia, Penn.; \$15,000.

**Auto Motor Car Company**, Aberdeen, N. D.; \$10,000; H. A. Page, Sr.; H. A. Page, Jr.; R. J. Cochran, W. A. Blue and others.

**Sommerest Garage Company**, Boston, Mass.; \$15,000; J. J. Shea, L. L. Cambridge.

**Zip Cyclecar Company**, Davenport, Ia.; \$25,000; R. W. Phelps, G. Decker French, F. W. Skinner.

**Williams-Hasley Motor Car Company**, Pittsburg, Penn.; \$15,000; S. Hasley, S. A. Williams, W. G. Hasley.

**Burns Automobile Exchange**, New Orleans, La.; \$10,000; general automobile business and to specialize in exchange of second hand cars; W. T. Burns, William H. Byrnes, Helen McGrath.

**Taxicab Association**, New York City; \$50,000; to manufacture and deal in automobiles; L. H. Biglow, Jr., A. L. Loomis, A. Wichfeld.

**Bond Automobile Company**, St. Louis, Mo.; \$10,000; wholesale buying and selling automobiles, accessories and automobile repairing; Mark W. Bond, Caroline Bond, Charles Kist.

**John J. Roche Company**, Hartford, Conn.; \$50,000; to

deal in automobiles and supplies; John J. Roche, Carroll F. Roche, Henry W. Nichols.

**Doughty Tire Company**, Portland, Me.; \$2,000,000; T. L. Croteau, Albert A. Richards, B. M. Maxwell.

**Aurora Vulcan Company**, Bridgeport, Conn.; \$250,000; to manufacture automobile supplies.

**Frankfort Motor Car Company**, Frankfort, Ky.; \$3000; T. P. Rogers, J. G. Rogers, O. C. Kenney, J. E. Manford, A. L. Manford, A. L. Bacon.

**A. P. Mitchell Auto Company of Fort Worth**, Fort Worth, Tex.; \$15,000; F. L. Toepperwein, J. R. Walker, H. Roos.

**Dimmer Company of America**, Chicago, Ill.; \$21,000; A. A. Pantells, O. O. H. Weldner, John H. Lally.

**C. & P. Kerosene Carburetor Company**, New York City; \$100,000; H. Anderson and others.

**Buckeye Motor Trucking Company**, Cleveland, O.; \$10,000; F. E. Kulas, E. Powell and others.

## WITH THE MANUFACTURERS.

**The Firestone Tire & Rubber Company**, Akron, O., has established a separate sales and shipping department to take care of its increasing foreign business, with C. O. Brandes in charge as manager.

**The Electric Storage Battery Company**, Philadelphia, is well known to motorists because of its production of Exide, Hycap-Exide, Thin-Exide and Ironclad-Exide batteries for electric vehicles. The company has been engaged in this field since 1888, and that its factory force is sufficiently large to justify its claim as one of the leading battery makers in the country is indicated by the accompanying illustration. The company maintains branches in New York, Boston, Chicago, St. Louis, Cleveland, Atlanta, Detroit, Denver, San Francisco, Los Angeles, Seattle, Portland, Ore., and Toronto, Can. All told there are some 886 Exide battery distributors.

**The White Company**, Cleveland, O., is building an addition to its plant at East 79th street. The main building will be enlarged by the erection of a new building to be 30 by 240 feet, at a cost of \$10,000.

**The Sheffield Motor Works**, Sheffield, Eng., has closed a contract with the United States Light & Heating Company, Niagara Falls, N. Y., and hereafter will equip all its cars with the U-S-L starting and lighting system.

**The Walker Tire Chain Company** has been organized in Bridgeport, Conn., to produce a new anti-skidding device invented by Charles Smith and John Anderson. H. F. Rhorman, Zanesville, O., is vice president.

**The Grant-Lees Machine Company**, Cleveland, O., has just completed a new addition to its factory and now has production facilities almost doubling what they were a year ago.

**The Champion Spark Plug Company** has been awarded a permit for the erection of a new factory building at Avondale and Upton avenues, Toledo, O.

**The Stromberg Motor Devices Company**, Chicago, is to open a factory branch at 146 West 56th street, New York City.

**The Perfection Spring Company**, Cleveland, O., has leased a building on East 65th street and will utilize this as an addition to its plant.

**The F. L. Moore Truck Company** has moved from Los Angeles, Cal., to a new factory at Torrance. The new building is of concrete and steel, 100 feet by 500 feet, with glass sides and top.

**Henry J. Arnold** and associates have started a plant in Denver, Col., for the manufacture of a substitute motor fuel for gasoline.



# New Departure Ball Bearings



*American Made for American Trade*

## The Proof of the Bearing Is in Its Service

The garage man knows better than anybody the comparative service merit of the bearings installed in motor cars he cares for and repairs.

We recently sent out letters to garagemen throughout the country, asking them their opinion of the New Departure Ball Bearing, based on their experience with it.

The complete summary of all responses received the first week shows that 96 per cent. of the garagemen who have been using New Departures found them absolutely satisfactory. Many of them went so far as to say that it has proved superior to all others.

This remarkable evidence of the quality and efficiency of the New Departure Ball Bearing is absolutely indisputable. Users of foreign-made ball bearings, whether garagemen or manufacturers, should give this American-made bearing a thorough trial.

Every manufacturer, purchasing agent, superintendent, and designing engineer, should have the Engineering Edition of the New Departure Ball Bearing Catalog and the brochure on "Bearing Friction and Its Elimination."

Every garage proprietor and superintendent should have the new Ball Bearing Garage Manual now in its third edition. Either one, or all of these books, will be sent free on request. Drop us a line now.

**THE NEW DEPARTURE MFG. CO., BRISTOL, CONNECTICUT**

**Western Branch 1016-17 Ford Bldg., Detroit**

When Writing to Advertisers, Please Mention The Automobile Journal.



**The Jiffy Auto Curtain Company**, Detroit, has taken larger quarters in the Dodge Power building.

**The Spenny Motor Car Company**, Tucson, Ariz., has closed negotiations to take over the plant of the Dearborn Engraving Company at Holland, Mich., and remodel it into an automobile factory. The new plant will be used at first as an assembling station, but eventually cars will be manufactured there.

**The Gibson Motor Company** of Pittsburg, Penn., has taken over the plant of the Miller Planing Mill at Rochester, Penn., and will manufacture motor cars.

**The Fiat Automobile Company**, Poughkeepsie, N. Y., is erecting an addition to its plant.

**F. H. Berger**, chief engineer of the Oakland Motor Car Company, Pontiac, Mich., has resigned. He is succeeded by **N. E. Wahlberg**, engineer for the Durant-Dort Carriage Company, Flint, Mich.

**The John W. Brown Manufacturing Company**, Columbus, O., lamp manufacturer, has increased its capital from \$490,000 to \$600,000.

**The United States Light & Heating Company**, with main office in New York City, claims to operate one of the largest factories in the world devoted to the production of storage batteries, etc. An accompanying illustration indicates the extent of the plant in Niagara Falls, N. Y. The company is quite as well known to motorists as the maker of the U-S-L lighting and starting system, which is being fitted to many cars. Service stations are

trated garage and machine works to double its original size. The new addition will be used exclusively for automobiles and supplies.

**The Central Garage**, Reading, Penn., is building a new addition 30 by 40 feet.

**F. G. Diamond**, Rydal, Penn., has plans prepared for the erection of a two-story stone garage.

**F. B. Gaunt** and **E. Roberts**, Lodi, Cal., are having their garage remodelled and improved.

**Louis Stein**, Philadelphia, Penn., has purchased the large two-story garage at the corner of Broad and Huntington streets.

**L. F. Tweed** and **Murrell Ellis**, Devils Lake, N. D., have opened for business in the garage formerly operated by the State Auto Company. It will be conducted under the name of the Great Northern Auto Company.

**The Metal Welding & Brazing Works**, Columbus, O., is a new automobile repair shop opened at 75 East Mount street.

**The National Car Company**, St. Paul, Minn., has opened a garage at 124 West Fourth street.

**F. A. McCormick & Son**, Manchester, O., has opened a motor car repair shop on East Second street.

**The Des Moines Imperial Company**, Des Moines, Ia., has been organized and will handle the Imperial cars exclusively.

**Henry Vogel**, Carrington, N. D., has sold his interest in the Bull Dog garage to his partner, **L. H. McMahan**.

**The Lockwood-Luetkemeyer-Henry Company**, Cleveland, O., has taken the Cleveland agency for the Empire Tire Company.

**The Central Auto Company**, Keokuk, Ia., has been taken over by **Smith & Cox**, succeeding **Smith & Perdue** in the ownership. The new firm will operate a repair shop as well.

**J. A. Pike**, Danbury, Conn., has leased part of the Starr factory and will start business under the name of the Danbury Welding Company.

**Charles Roeder**, Coopersburg, Penn., has purchased **William M. Applegate's** garage in Bethlehem and has taken charge of the business.

**The Ford Garage & Supply House**, West Point, Neb., has been sold to **John E. Wiesner**, who will continue the business.

**J. C. Baird**, Portland, Ore., is having a new building erected at a cost of \$15,000, part of which will be used as a garage.

**The W. D. Newerf Company**, Los Angeles, Cal., is planning for new and larger quarters to be ready for occupancy about the first of the year.

**F. A. Havens & Co.**, Philadelphia, is estimating on plans and specifications for alterations and additions to the residence and garage of **W. K. Wetherill** at Wynnewood, Penn.

**The Fire Department**, Fort Worth, Tex., is erecting a garage at the central station for the use of municipal machines.

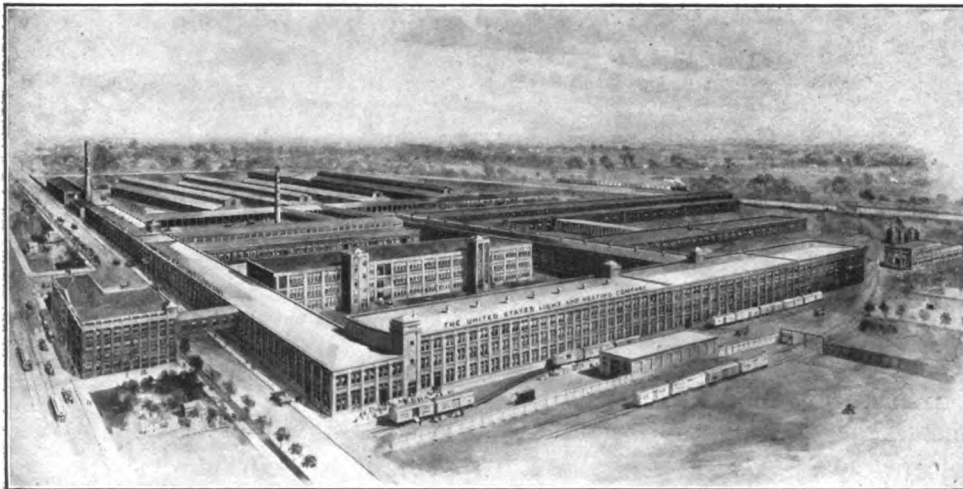
**The Ford Motor Company of Canada** is to erect a six-story building at Dupont and Christie streets, Toronto, at a cost of \$250,000.

**The Ohio Auto Sales Company**, Columbus, O., has had plans prepared for the erection of a new sales and office building near Warren street.

**William J. Payne & Co.**, Allentown, Penn., is to erect a garage on Allen avenue to cost \$5500.

**John I. Bagduina**, Chicago, is erecting a one-story garage at 2334-2336 South Oakley avenue, at a cost of \$1000.

**C. E. Meyers**, Washington, D. C., is converting a building in the alley between Third, Fourth, G and H streets into a public garage, at a cost of \$5600.



**The U-S-L Plant at Niagara Falls, N. Y., Claimed to Be the Largest Storage Battery Factory in the World.**

maintained in connection with the branches in New York, Boston, Buffalo, Cleveland, Detroit, Chicago, St. Louis and San Francisco.

#### GARAGE AND DEALER.

**The Andrew Garage Company**, New York City, is to have a new five-story garage built on East 79th street.

**Albert Snyder**, Allentown, Penn., will have a new modern garage erected.

**The Bakersfield Garage**, Bakersfield, Cal., is to be enlarged by the erection of an addition.

**The Miles B. Mank Motor Car Company**, Portland, Me., is to have its building enlarged and improved.

**The Athens Motor Company**, Athens, N. Y., is to have an addition built to its garage on South Elmira street to be used as a repair department. When finished the entire building will be 90 by 120 feet and fireproof throughout.

**L. F. Hersh & Bro.**, Elizabeth, N. J., is planning the erection of a new garage on Westfield avenue.

**Percy L. Neel**, Philadelphia, Penn., has purchased the six-story reinforced concrete garage at 142-144 North Broad street, of which he has been the occupant, for \$150,000 and mortgage of \$150,000.

**Charles F. Eggleston**, Chester, Penn., has plans for a new office and garage at Second and Main streets.

**E. L. Stanfield**, Barstow, Cal., is enlarging the Cen-



## RECENT PATENTS.

**Electric Gearshift**, Ralph W. Bradley, Fort Collins, Col., No. 1,074,599. Filed Jan. 28, 1913.

**Radiator Vent Valve**, Andrew Jackson, Chicago, No. 1,074,624. Filed March 14, 1913.

**Muffler**, Charles Hinton Kenney, New London, Conn., No. 1,074,627. Filed March 29, 1913.

**Shock Absorber**, Charles N. Sowden, Guantanamo, Cuba, No. 1,074,658. Filed Sept. 11, 1912.

**Automobile Jack**, W. Claughton Bouldin, Oakland, Tex., No. 1,074,690. Filed Aug. 29, 1912.

**Tank Gauge**, Bernard H. Camden, Washington, D. C., No. 1,074,692. Filed July 3, 1912.

**Friction Transmission**, Adolph Gazagnaire, Cannes, France, No. 1,074,710. Filed April 2, 1912.

**Lamp**, Charles E. Godley, Detroit, assignor to Edmunds & Jones Manufacturing Company, same city. No. 1,074,712. Filed May 12, 1913.

**Ignition System**, Leon J. LePontois, New Rochelle, N. Y., assignor by mesne assignments to H. W. Johns, No. 1,074,724. Filed June 15, 1909.

**Automatic Gas Lighter**, Henry Meyer, New York City, No. 1,074,728. Filed Dec. 27, 1912.

**Lubricating Apparatus**, William L. Morris, Cleveland, O., assignor to S. F. Bowser & Co., Fort Wayne, Ind., No. 1,074,730. Filed Aug. 5, 1905.

**Speedometer Drive**, Frank M. Murray, Cadyville, N. Y., No. 1,074,732. Filed Jan. 4, 1913.

**Steering Gear**, Marcus D. Satterlee, Andover, and Nellie C. Satterlee, Williamsfield, O., No. 1,074,748. Filed Oct. 3, 1912.

**Automobile Cut-Out**, Raymond T. Whipple, San Jose, Cal., No. 1,074,762. Filed July 15, 1912.

**Windshield**, Guy B. Collier, Kinderhook, N. Y., No. 1,074,774. Filed Aug. 8, 1910.

**Distributor for Ignition Systems**, Anton Diemer, Stuttgart, Germany, assignor to the firm of Robert Bosch, same place, No. 1,074,777. Filed March 28, 1913.

**Vehicle Wheel**, George F. Godley, Philadelphia, Penn., No. 1,074,787. Filed July 18, 1912.

**Engine Starting Apparatus**, Edward A. Halbleib, Rochester, N. Y., assignor to Northeast Electric Company, same place, No. 1,074,790. Filed July 8, 1910.

**Oil Can**, John W. Nilsson, Balfour, N. D., No. 1,074,810. Filed June 27, 1910.

**Automobile Marker Bracket**, David H. Cox, Roselle, N. J., No. 1,074,838. Filed April 18, 1911.

**Lock Joint for Windshields**, Joseph F. Currey, Newark, N. J., assignor to Ulysses G. Clark, New York City, No. 1,074,839. Filed April 10, 1913.

**Two-Cycle Motor**, Francois Pilain, Lyon, France, No. 1,074,894. Filed Dec. 31, 1912.

**Tire**, Charles Louis Schwarz, Philadelphia, Penn., No. 1,074,899. Filed Jan. 29, 1912.

**Chain Case for Automobiles**, Harry C. Heath, San Francisco, Cal., No. 1,074,947. Filed July 24, 1912.

**Lock Joint for Windshields**, Alexis Krah, New Haven, Conn., assignor to English & Mersick Company, same city, No. 1,074,958. Filed April 19, 1913.

**Keyless Automobile Clock**, Wilson E. Porter, New Haven, Conn., assignor to New Haven Clock Company, same place, No. 1,074,975. Filed Jan. 11, 1913.

**Motor Starter**, William R. Strickland, Cleveland, O., assignor to Peerless Motor Car Company, same city, No. 1,074,990. Filed Jan. 5, 1912.

**Motor Plow**, Joseph Nicholas Parker, Bedford City, Penn., No. 1,075,061. Filed Sept. 7, 1912.

**Motor Vehicle**, James Wesley Bruce, Ozark, O., No. 1,075,088. Filed Sept. 17, 1912.

**Wrench**, Richard P. Habel, Sturgis, S. D., No. 1,075,100. Filed Aug. 28, 1912.

**Elastic Wheel**, Jacobus Spyker, Amsterdam, Holland, No. 1,075,168. Filed Aug. 13, 1910.

**Nut Lock**, Antony Mazur and Paul Mudrak, Natalie, Penn., No. 1,075,218. Filed April 24, 1913.

**Nut Lock**, Mike Schotsch, Youngstown, O., No. 1,075,226. Filed March 10, 1913.

**Air Valve for Radiators**, Fred W. Leuthesser, Chicago, No. 1,075,294. Filed May 19, 1913.

**Explosive Engine**, John Joel Shively, Washington, D. C., No. 1,075,307. Filed May 26, 1910.

**Pneumatic Tire**, Frederick C. Felker, Racine, Wis., No. 1,075,345. Filed April 1, 1912.

**Automobile Wheel Help**, Francis V. Phillips, Orlando, Fla., No. 1,075,377. Filed June 11, 1913.

**Internal Combustion Engine**, Richard C. Rose, Osceola, Ark., No. 1,075,383. Filed July 15, 1912.

**Clutch**, Justus B. Entz, Philadelphia, Penn., No. 1,075,412. Filed Aug. 11, 1905.

## COMING EVENTS.

## October.

Oct. 27-28—Convention, Electric Vehicle Association of America, Chicago, Ill.

## November.

Nov. 2-3—Road race, El Paso, Tex.—Phoenix, Ariz.  
 Nov. 3-8—Motorcycle show, Coliseum, Chicago, Ill.  
 Nov. 4-5—Road race, Los Angeles, Cal.—Phoenix, Ariz.  
 Nov. 4-5—Road race, San Diego, Cal.—Phoenix, Ariz.  
 Nov. 6—Track races, Phoenix, Ariz.  
 Nov. 8-12—Track races, Shreveport, La.  
 Nov. 7-15—Olympia Show, London, England.  
 Nov. 8-15—Show, Atlanta, Ga.  
 Nov. 22-29—Show, Providence, R. I.  
 Nov. 24—Show, Savannah, Ga.

## December.

Dec. 1-3—Annual meeting, American Automobile Association, Richmond, Va.  
 Dec. 9-12—Convention, American Road Builders' Association, Philadelphia, Penn.  
 Dec. 10-12—Convention, Retail Implement & Vehicle Dealers' Association, Milwaukee, Wis.  
 Dec. 11-20—International exposition of safety and sanitation, American Museum of Safety, New York City.

## January.

Jan. 2-10—Importers' Salon, Hotel Astor, New York City.  
 Jan. 3-10—Pleasure car show, Grand Central Palace, New York City.  
 Jan. 10-16—Show, Milwaukee, Wis.  
 Jan. 10-17—Show, Cleveland, O.  
 Jan. 24-31—Show, Rochester, N. Y.  
 Jan. 24-31—Pleasure car show, Coliseum, Chicago, Ill.  
 Jan. 26-31—Show, Scranton, Penn.  
 Jan. 31-Feb. 7—Show, Minneapolis, Minn.

## February.

Feb. 2-7—Pleasure car show, Buffalo, N. Y.  
 Feb. 9-14—Truck show, Buffalo, N. Y.  
 Feb. 18-21—Show, Bloomington, Ill.  
 Feb. 22-March 5—Show, Cincinnati, O.  
 Feb. 23-28—Show, Omaha, Neb.  
 Feb. 24-28—Show, First Regiment Armory, Newark, N. J.

## March.

March 7-14—Pleasure car show, Mechanics' Building, Boston, Mass.  
 March 17-21—Truck show, Mechanics' Building, Boston, Mass.

## April.

April 9-15—Show, Manchester, N. H.

## May.

May 30—500-mile race, Indianapolis, Ind.

## NEW BOOKS RECEIVED.

**Baker Armored Concrete Pavement**, R. D. Baker Company, Detroit. It contains a description of pavement laid by this concern, and is well illustrated with roads which have seen various classes of service.

**Vulcan Motor Cars**, Vulcan Manufacturing Company, Painesville, O. A splendidly illustrated catalogue of the new Vulcan cars made by this concern, with complete mechanical description of the various components.

**The Bosch News**, Bosch Magneto Company, 223-225 West 46th street, New York City. October number calls special attention to new Bosch products, including the Bosch press button key switch and the Bosch-Ford attachment.

**The Lincoln Highway of Colorado**, Lincoln Highway Association of Colorado, Colorado Springs, Col. It presents a log of the new improved highway connecting Kansas and Utah through the centre of Colorado. Fully illustrated.

**Her Ladyship's Coach**, Stevens-Duryea Company, Chicopee Falls, Mass. A neat little brochure reciting the history of well appointed carriages designed to lend social distinction to the possessor, and calling especial attention to the limousine made by this company. Illustrated.



## BRITISH ENGINEER DISCUSSES FUELS.

**B** RITISH motor vehicle users are much interested in the increasing price of fuel, and it is not at all surprising that the new president of the Institution of Automobile Engineers, J. S. Critchley, should devote a large part of his inaugural address to "The Fuel Question". After citing the decrease in production of gasoline in this country and its effect upon the price in America, Mr. Critchley said:

In Great Britain, the estimated amount of petrol (gasoline) which will be consumed during the current year is 100,000,000 gallons. The total registration of vehicles in Great Britain in 1912 was 188,874, showing an increase of 28,982 over the preceding year. A considerable number of registrations are cancelled, but I think it would be safe to assume that 110,000 motor vehicles are in use. The buses and taxicabs of London number about 10,000 vehicles, and will consume approximately 20,000,000 gallons, while motor boats, motorcycles and other users will absorb at least another 10,000,000 gallons, so that for 100,000 vehicles we have some 70,000,000 gallons of petrol consumed.

Petrol as we know it today is practically the distillate of petroleum, which will completely vaporize without heat application and which has no fire test, that is, it will flash at any temperature. In the lower grades the boiling point may be over 150 degrees C. and the specific gravity over .760. There is no fixed point of demarcation between kerosene and motor fuel. Just where the one ends and the other begins in the distillation is controlled somewhat by the market price. If kerosene were the more value of the two the distiller would be careful enough to see that none of it entered into the composition of the motor fuel, and vice versa. The commercial difference between the two is that kerosene will only ignite when its temperature has been raised to a certain degree, depending on the grade, of which there are many. The lowest grade is 110 degrees fire test, the highest being 150 degrees fire test. The volatility of the lower grade is very much greater than that of the higher grades and the price again is fixed by the degree of the fire test.

The carburetor for an automobile must fulfill the following conditions: The combustion must be perfect to a degree that there shall not be any offensive odor or visible exhaust; the fuel must be regulated to respond instantaneously to changes due to varying speed and load, and the combustion of the fuel must not deposit carbon or any other substance within the cylinder. In addition to its lack of volatility, kerosene has a smaller range of combustible mixtures with air than petrol, and greater viscosity, and it is much more difficult to obtain the proper physical conditions for combustion than in the case of volatile liquids and gases. It is, indeed, difficult to fulfill the requirements with kerosene carburetors as we know them today, and I do not think we are yet able to come to a conclusive opinion as to the best method of dealing with this fuel.

Mr. Critchley then dwelt at some length upon conditions and findings by various authorities, many of which have been presented at more or less length in the article on "Heavy Fuels" now running serially in these columns. He also called attention to various processes for blending different grades of hydrocarbons, which have been introduced on the Continent of Europe, and which he suggested were the result of endeavor to revive old patents somewhat changed and reconstructed.

Since there has been some little attempt to use benzol in Great Britain, what Mr. Critchley had to say on this subject undoubtedly will prove of interest to American readers. It was in part as follows:

Benzol has the chemical formula of  $C_6H_6$ , and is a water white fluid, with a specific gravity of .880. Pure benzol freezes at 42 degrees F., and to keep it fluid in cold weather a mixture with toluol,  $C_7H_8$ , is necessary. To produce 100,000 gallons of benzol and toluol, coal to the amount of 1,625,000 tons is treated. The small amount produced per annum would only be sufficient for two days' fuel supply for the London General Omnibus Company. The cost price of benzol at the gas works is stated to be 8d per gallon in bulk. At 8d per gallon there is no profit over selling the tar at 3d per gallon.

The carburetion of benzol presents no difficulties, but it is doubtful if the best results are obtained with an engine which has been designed for petrol, and it is probable that if a type of engine were specially designed for benzol, greater efficiency would be obtained than by merely employing this fuel with an engine designed for petrol.

Some very interesting trials have been conducted by Dr. Dieterich with benzol and other fuels on an Opel car with an engine having cylinders 70 mm bore by 100 mm stroke (2.76 by 3.93 inches), with standard type of carburetor. The tests were made on a stretch of road 10 kilometers in length under equal conditions regarding temperature and weather. The results obtained with the different mixtures are as follows:

1. **Ether**—Ordinary ethyl made from alcohol and sulphuric acid, containing about 70 per cent. of carbon, eight per cent. of hydrogen, and 22 per cent. of oxygen; specific gravity, .718 to .725; calories, 9000 per kilogram; price in Germany, minus the tax, 10d per kilogram. Used as fuel, unmixed, quickly stalled motor, mainly by reason of the great cooling produced by the rapid evaporation of this highly volatile liquid.

2. **Petroleum-Ether**— $C_3H_8$ ,  $C_4H_{10}$ ,  $C_5H_{12}$  (mainly the latter, the pentane), containing 85 per cent. carbon, 15 per cent. of hydrogen; specific gravity, .650 to .680; calories, 11,000; price, 7.5d. Results poor, as under 1.

3. **Ordinary Petrol**—Hexane, heptane and octane; 85 per cent. carbon, 15 per cent. hydrogen; specific gravity, .680 to .720; calories, 9500 to 11,000; price, 7d. Produced a maximum speed of 50 kilometers per hour with a consumption of one liter for eight kilometers. The usual advantages over benzol and heavy petrol in the way of responsive acceleration and the greater power arising from rapid flame propagation.

4. **Heavy Petrol**—Octane and higher grade paraffin (kerosene); 85 per cent. carbon, 15 per cent. hydrogen; specific gravity, .730 to .760; calories, 10,500; price, 5.75d. Produced a maximum speed of 44 kilometers, and a consumption of one liter for seven kilometers. Motor sluggish and acceleration slow.

5. **Benzol**— $C_6H_6$ ; 92 per cent. carbon, eight per cent. hydrogen; specific gravity, .8997; calories, 9500 to 10,000; price, 4d. Gave nine kilometers to the liter, but a maximum speed of only 42.25 kilometers. Same drawbacks as with heavy petrol.

6. **Heavy Petrol and Ethyl Ether**—Equal weight parts, price 8d. Results poor; very little power.

7. **Same Ingredients**—Proportions 1:1.5; price 9d. Results poor, showing ether to be useless for admixture, apart from price consideration.

8. **Heavy Petrol and Petroleum-Ether**—Equal parts; specific gravity, .701; calories, 10,000; price, 6.75d. Gave eight kilometers to the liter; maximum speed, 45 kilometers. The acceleration was better than with heavy gasoline alone.

9. **Same Ingredients**—Proportions, 1:1.5. The results were almost as poor as with petroleum-ether alone.

10. **Benzol and Petroleum-Ether**—Proportions, 1:1.5; specific gravity, .705; calories, 10,750; price, 6.25d. Gave eight kilometers to the liter; maximum speed, 48 kilometers. Acceleration and results generally better than with benzol alone.

11. **Same Ingredients**—Equal parts; specific gravity,



.725; calories, 10,500; price, 5.75d. Gave eight kilometers to the liter; maximum speed, 50 kilometers. Took grades on third speed which with ordinary gasoline required second speed. An important improvement upon unmixed benzol.

12. **Same Ingredients**—Proportions, 2:1; specific gravity, .797; calories, 10,300; price, 5d. Gave a little more than eight kilometers per liter, and a maximum speed of 54 kilometers. Took all grades with higher gears than possible with other fuels. Good acceleration and lively explosions. Better than ordinary petrol of .680 to .720 gravity.

The supplies of benzol seem to vary very considerably in quality, and in view of the position that benzol seems likely to take as a motor fuel, the present time would appear to be an opportune one for some standard of composition to be decided upon. The best volatility and the permissible amount of impurities, such as sulphur, should be ascertained and fixed; there should also be some limit to the amount of toluol which it is necessary to add to keep the fluid liquid at low temperatures. The worst feature in connection with benzol is, of course, its smell, but it is a fuel which must be encouraged by all possible means.

Attention was drawn to recent tests of naphthalene in Paris with a Renault cab, fitted with a special carburetor consisting of a melting receptacle in which the melted naphthalene was maintained by the exhaust at a heat above its melting point and from which it was conveyed to a heated float feed carburetor. It was, of course, necessary to start the engine on gasoline, and it was found that the shortest time which must elapse before the naphthalene could be turned on was 13:37. A stop of 10 minutes could be made without resorting to gasoline for starting, while a stop of 16 minutes necessitated its use.

Other subjects treated briefly were: Energizing or "doping" gasoline with picric acid, ammonium nitrate, etc.; obtaining fuel from creosote, bituminous coal and shale, and the use of alcohol as fuel. Concerning the last named Mr. Critchley said in part:

In view of the repeated assurances that alcohol is the real solution, it is necessary for me to bring this matter to your notice. We must, I think, admit that as far as practical experience goes in this country, we have had very little opportunity of finding out the merits or demerits of alcohol as a motor fuel.

Before the question of suitability or otherwise of alcohol as a fuel for automobiles can be fully decided, a tremendous amount of research work is necessary. In the first place there is the question of the production of the alcohol in sufficient quantities at a price which will make its use economical. I think it is quite useless to contend that alcohol can be made at a competitive price from potatoes or beets grown in this country. According to some authorities alcohol can be manufactured in the British colonies at 4d to 6d per gallon, and from peat at even less cost.

If the motorists of this country are serious in the endeavor to provide a fuel which can be produced in unlimited quantities and not subject to market fluctuations, they should get together and devise some scheme whereby sufficient money can be provided to solve or decide the question as to the possibilities of alcohol. No doubt many of our colonies themselves would contribute to such a scheme. It seems somewhat ridiculous to pass resolutions to the effect that alcohol is the only fuel which will save the situation and to take no action to carry such resolutions into practical effect.

In conclusion, Mr. Critchley expressed himself as follows:

At the present time the petrol internal combustion engine has practically no rival, but in commercial work Providence is always on the side of low prices, and if by reason of the price of petrol other systems than those with which we are now conversant turn out more economical they will surely come to the front. We engineers have no axe to grind as regards fuel, and study all propositions with an open mind.

## DOUBLE LIGHTING SYSTEM.

### Luverne Car Is Offered with Both Electric and Acetylene Headlights.

Offering the owner an ever present option between electric and acetylene headlights, the Luverne Automobile Company, Luverne, Minn., has fitted a double lighting system on its new big brown Luverne car. It is expected that this plan will meet with decided approval, and, indeed, this seems to have been the case with those who have already secured new machines thus equipped.

The regular system consists of electric lights throughout with current furnished by a Vesta generator, which is driven through silent chain from the motor, and an LBA storage battery. The headlights are fitted with both electric bulbs and gas tips, mounted on a triangular bar, so that either the bulb or the tip may be placed in front of the reflector, with the other out of the way entirely. The change in lights can be made instantly, and a snap lock holds them securely in place. The headlights are connected up with both electric wiring and tubing to the Prest-O-Lite tank, so that in case of temporary failure of the electric system, the gas light system is instantly available. The tank is neatly mounted out of sight in the double running board which is held to be one of the exclusive features of the Luverne.

**Correction of Error**—In a special article on the National Highways Association in the issue of The Automobile Journal for Sept. 25, the address of the organization department of the association was given as 515 Hartman building, Chicago. This department is under the direction of Jesse Taylor, whose address is Jamestown, O.

C. H. Dunlop, export manager of the Hupp Motor Car Company, is now on a visit to Paris and London, and while abroad he will attend the annual shows in those cities and confer with the Hupmobile dealers on the Continent. The company reports that half of its total output for 1914 has been contracted for delivery abroad.



# FIRST ALLOTMENT OF ACCESSORY SPACES.

THE show and allotment committee of the Motor & Accessory Manufacturers at a meeting in New York City last week completed the allotment of space to the members of the association for the 14th annual national automobile shows to be held in Grand Central Palace, New York City, Jan. 3-10, and at the Coliseum Annex and First Regiment armory, Chicago, Jan. 24-31. The total number of applications acted upon was 102 for New York and 101 for Chicago, some few exhibitors making display at one show only. Last January there were 158 accessory exhibits in the two buildings at New York and 149 in Chicago. It will be understood that the list does not include all accessory exhibitors, since many concerns without membership in this body will be permitted to take any space that may be left. Those to whom allotment was made and the principal product of each, follow:

## New York and Chicago.

American Bronze Co., Berwyn, Penn., steels, etc.  
 American Hardware Corp., New Britain, Conn., speedometers.  
 Automobile Supply Mfg. Co., Brooklyn, N. Y., horns.  
 Apple Electric Co., Dayton, O., lighting and starting systems.  
 Badger Brass Mfg. Co., Kenosha, Wis., lamps.  
 Benford Mfg. Co., New York City, spark plugs.  
 Blackledge Mfg. Co., J. W., Chicago, shock absorbers.  
 Bowser & Co., S. F., Ft. Wayne, Ind., storage systems.  
 Brown-Lipe Chapin Co., Syracuse, N. Y., transmission, etc.  
 Buda Co., Harvey, Ill., motors.  
 Byrne, Kingston & Co., Kokomo, Ind., carburetors.  
 Carr Co., F. S., Boston, Mass., top materials.  
 Champion Ignition Co., Toledo, O., spark plugs.  
 Cook's Sons, Adam, New York City, lubricants.  
 Cowles & Co., C., New Haven, Conn., lamps, etc.  
 Cramp & Sons Ship & Engine Bldg. Co., Philadelphia, steels, etc.  
 Dean Electric Appliance Co., Detroit, starters, etc.  
 Detroit Lubricator Co., Detroit, lubricators.  
 Dixon Crucible Co., Joseph, Jersey City, N. J., graphite lubricants.  
 Doehler Die Casting Co., Detroit, bearings and parts.  
 Double Fabric Tire Co., Auburn, Ind., tires.  
 Dykes Co., J. L. G., Chicago, tire accessories.  
 Dyneto Electric Co., Syracuse, N. Y., lighting systems.  
 Edison Storage Battery Co., Orange, N. J., storage batteries.  
 Edmunds & Jones Mfg. Co., Detroit, lamps.  
 Electric Auto-Lite Co., Toledo, O., lighting system.  
 Electric Storage Battery Co., Philadelphia, storage batteries.  
 Findelsen & Kropf Mfg. Co., Chicago, carburetors.  
 Gabriel Horn Mfg. Co., Cleveland, O., horns, etc.  
 Garage Equipment Mfg. Co., Milwaukee, Wis., equipment.  
 Gemmer-Detroit Starter Co., Detroit, starters.  
 Globe Machine & Stamping Co., Cleveland, O., metal boxes.  
 Gray & Davis, Boston, Mass., lighting and starting.  
 Harris Oil Co., A. W., Chicago, lubricants.  
 Hartford Suspension Co., Jersey City, N. J., shock absorbers, etc.  
 Hayes Mfg. Co., Detroit, metal bodies.  
 Heinze Electric Co., Lowell, Mass., ignition.  
 Hofferker Co., Boston, Mass., speedometers.  
 Ignition Starter Co., Detroit, starters.  
 International Acheson Graphite Co., Niagara Falls, N. Y., lubricants.  
 J. M. Shock Absorber Co., Philadelphia, shock absorber.  
 Kellogg Mfg. Co., Rochester, N. Y., pumps.  
 Kent Mfg. Works, Atwater, Philadelphia, ignition.

Leather Tire Goods Co., Niagara Falls, N. Y., tire protectors.  
 Mezger, C. A., New York City, windshields.  
 Mosler & Co., A. R., New York City, spark plugs.  
 Motometer Co., New York City, motometers.  
 Motsinger Device Mfg. Co., Lafayette, Ind., ignition.  
 National Coil Co., Lansing, Mich., ignition.  
 National Lead Co., New York City, die castings.  
 National Tube Co., Pittsburg, Penn., steel tubing.  
 N. Y. & N. J. Lubricant Co., New York City, lubricants.  
 North East Electric Co., Rochester, N. Y., lighting and starting.

Oliver Mfg. Co., Chicago, jacks.  
 Pantasote Co., New York City, top materials.  
 Piel Co., The G., Long Island City, N. Y., horns.  
 Randall-Faichney Co., Boston, Mass., horns.  
 Remy Electric Co., Anderson, Ind., ignition.  
 Reynolds-Browne Co., Chicago, Ill.  
 Rose Mfg. Co., Philadelphia, license brackets.  
 Royal Equipment Co., Bridgeport, Conn., brake lining etc.  
 Sager Co., J. M., Rochester, N. Y., shock absorbers, etc.  
 Schoen-Jackson Co., Media, Penn., carburetors.  
 Schrader's Sons, Inc., A., New York City, tire gauges.  
 Schwarz Wheel Co., Philadelphia, wheels.  
 Shaler Co., C. A., Waupun, Wis., vulcanizers.  
 Simms Magneto Co., New York City, ignition.  
 Sireno Co., New York City, horns.  
 Sparks-Withington Co., Jackson, Mich., fans and boxes.  
 Spicer Mfg. Co., Plainfield, N. J., universal joints.  
 Splittorf Electrical Co., Newark, N. J., ignition.  
 Springfield Metal Body Co., Springfield, Mass., bodies.  
 Standard Thermometer Co., Boston, Mass., speedometers.  
 Stewart-Warner Speedometer Corp., Chicago, speedometers.  
 Stromberg Motor Devices Co., Chicago, carburetors.  
 Torbenson Gear & Axle Co., Newark, N. J., axles, etc.  
 U. S. Light & Heating Co., New York City, lighting and starting.  
 Vacuum Oil Co., Rochester, N. Y., lubricants.  
 Valentine & Co., New York City, varnishes.  
 Veeder Mfg. Co., Hartford, Conn., recording devices.  
 Vesta Accumulator Co., Chicago, storage batteries.  
 Vorhees Rubber Mfg. Co., Jersey City, N. J., inner tubes.  
 Warner Gear Co., Muncie, Ind., gears, etc.  
 Warner Mfg. Co., Toledo, O., motors, etc.  
 Weed Chain Tire Grip Co., New York City, tire chains.  
 Westinghouse EL & Mfg. Co., Pittsburg, Penn., ignition, etc.  
 Wheeler & Schebler, Indianapolis, Ind., carburetors.  
 White & Bagley Co., Worcester, Mass., lubricants.  
 Willard Storage Battery Co., Cleveland, O., storage batteries.

## New York Only.

Breeze Carburetor Co., Newark, N. J., carburetors.  
 Budd Mfg. Co., Edward C., Philadelphia, bodies.  
 Carnegie Steel Co., Pittsburg, Penn., steels, etc.  
 Chase & Co., L. C., Boston, Mass., top materials.  
 Coes Wrench Co., Worcester, Mass., wrenches.  
 Hartford Machine Screw Co., Hartford, Conn., spark plugs.  
 Haws, George A., New York City, lubricants.  
 Herz & Co., New York City, ignition.  
 Janney, Steinmetz & Co., Philadelphia, tanks, etc.  
 Light Mfg. & Fdy. Co., Pottstown, Penn., aluminum castings.  
 Link-Belt Co., Philadelphia, chains.  
 Manufacturers' Fdy. Co., Waterbury, Conn., cylinder castings.  
 Spacke Mch. Co., F. W., Indianapolis, Ind., motors.

## Chicago Only.

Baldwin Chain & Mfg. Co., Worcester, Mass., chains.  
 Continental Motor Mfg. Co., Detroit, motors.  
 Cotta Transmission Co., Rockford, Ill., transmission gears.  
 Diamond Chain & Mfg. Co., Indianapolis, Ind., chains.  
 Gould Storage Battery Co., New York City, storage batteries.  
 Hess Spring & Axle Co., Carthage, O., axles.  
 Imperial Brass Mfg. Co., Chicago, pumps, etc.  
 Lovell-McConnell Mfg. Co., Newark, N. J., horns.  
 McCord Mfg. Co., Detroit, radiators.  
 Rutenber Motor Co., Marion, Ia., motors.  
 Waukesha Motor Co., Waukesha, Wis., motors.  
 Whitney Mfg. Co., Hartford, Conn., chains.





## EMPIRE *The Completely Equipped Empire five-passenger touring car \$900*

"The Little Aristocrat"

New Series Model 31

NOW

**\$900**

*Advances catalogue is ready  
We will send the pictured  
story of the Transcontinental  
Empire on request.*

Empire Automobile Co., Indianapolis, U. S. A.

**COLE** THE STANDARDIZED CAR

*The car that started the stampede to standardization*

A Cole franchise is a valuable asset to any dealer. Find out about it.

Cole Motor Car Co. of Indianapolis

TRADE MARK

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REG. U.S. PAT. OFF

"THE ORIGINAL AND BEST ASBESTOS BRAKE LINING"

THE ROYAL EQUIPMENT CO., BRIDGEPORT, CONN.

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GUARANTEED**

All Trade—No Owner Distribution

When you have anything to say to those in the automobile industry use straight trade talk copy in the

**Accessory and Garage Journal**

The only strictly automobile trade paper published in America.

**Automobile Journal Publishing Co.**

Publishers of

**AUTOMOBILE JOURNAL MOTOR TRUCK**

Times Building, Pawtucket, R. I.

**Studebaker**

"Accessibility of the motor a leading feature"

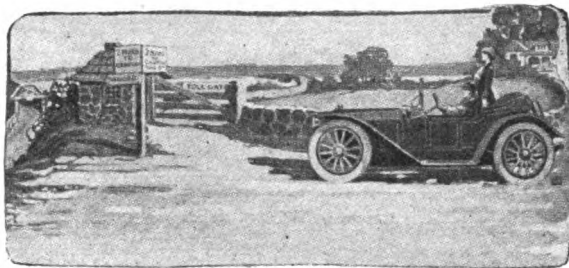
"25"—\$885 "35"—\$1290 "SIX"—\$1550

All prices for cars fully equipped F. O. B. Detroit.

STUDEBAKER, - - - DETROIT, MICH.

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The Accessory and Garage Journal

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**WHICH ROAD**—The highway at a trifling toll or the by-way with its deadly risks?

**You're not the man to hesitate!**

Nor can you debate long in choosing lubricants when the same fear, the same certainty of wear and tear attend the use of greases which save (?) a few nickels when you buy.

YOU can afford to use



at a little higher price per can when you secure the smooth, open road to long life for your car and the satisfaction of mindease about your bearings.

Silent gears, a smooth flow of power from engine to wheels, long service from the costly ball and roller bearings, cool, uncomplaining universal joints and differential—these are the NON-FLUID OIL delights, at perhaps a yearly comfort toll of one dollar—surely at a yearly saving of \$50 to \$100 in bearings and repairs.

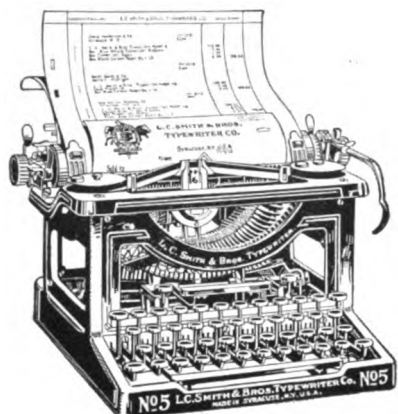
**You're not the man to hesitate!**

Be sure you get genuine NON-FLUID OIL, packed in orange colored cans bearing the above Trade Mark.

**New York & New Jersey  
LUBRICANT**

165 Broadway, New York  
CHICAGO PHILADELPHIA  
1430 Michigan Avenue 1416 Vine Street





Ball Bearing: Long Wearing

# CONDENSED BILLING

Is simple on an  
**L. C. Smith & Bros.  
Typewriter**

Condensed billing has been adopted by many business houses on account of its time-saving features.

**The L. C. Smith & Bros. Typewriter**  
is particularly adapted to this service and requires no extra attachments.  
The pressure roll lock and release device, the tabulator, the back spacer and the paper gauge make the L. C. Smith & Bros. typewriter a complete condensed billing machine.

These conveniences are part of the typewriter—not attachments—and there is no additional cost.

Write for free booklet, "The Measure of Worth". It explains how ball bearings make the L. C. Smith & Bros. typewriter the easiest running and most durable writing machine.

## L. C. Smith & Bros. Typewriter Co.

Head Office for Domestic and Foreign Business  
SYRACUSE, N. Y.  
*Branches in all principal cities.*

BOOKLET ON REQUEST

REPRESENTATIVES WANTED

# AUTOMOBILE TURNTABLES

THE T. C. BEACH CO.

106 Ottawa Street,

St. John, Mich.

ALWAYS SPECIFY  
**HOYT METERS**  
AND GET YOUR MONEY'S WORTH  
**HOYT ELECTRICAL WORKS**  
PENAGOOK, NEW HAMPSHIRE



## J-M AUTOMOBILE SUPPLIES

Brake Lining  
Spark Plugs  
Dry Batteries

Friction Tape  
Fire Extinguishers  
Radiator Shields

Packings  
Cements  
Fuses, Etc.

Write for Booklet



**H.W. JOHNS-MANVILLE CO.**  
NEW YORK AND EVERY LARGE CITY



**Aplco Electric Lighting System**

makes night riding safe and delightful. It is

"The right way to light the way."

Ask your dealer about it or write us.

**THE APPLE ELECTRIC COMPANY**  
74 Canal St., Dayton, Ohio

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**"The Car of No Regrets"**  
**\$1095** with Equipment  
 Ward Leonard Starter and Generator  
 for \$100 net additional

# KING

See the KING before you buy! It's fairness to yourself. You can't afford to purchase *any* car until this highest of motor values has been investigated. The KING gives *more* service, style, economy, power, riding comfort, conveniences and equipment than can be had in any car near its price, and has desirable, patented features which *no other* car can offer.

## FEATURES OF MODEL B, 30-35 HORSE-POWER

*Two Styles—One Chassis—Touring Car and Roadster*

Cantilever Rear Springs  
 Long-stroke Motor  
 Unit Power Plant

Three-point Suspension  
 Gemmer Steering Gear  
 Complete Electric Lighting

Full-floating Rear Axle  
 Left-hand Steer  
 18-inch Steering-wheel

Hyatt Roller Bearings  
 Center Control  
 112-inch Wheel-base

Briggs Magneto  
 Stromberg Carburetor  
 20-inch Rear Doors

Rain-vision Ventilating Windshield; Silk Mohair Top; Quick-attachable Curtains; Quick-detachable and demountable Rims; Stewart Warner Speedometer (listed \$50); Electric Horn; Extra Rim; Tire-Irons; Pump; Jack; Tire-repair Outfit; Tools, etc., all in regular equipment

*The first motor car run  
 on the streets of Detroit  
 was made by Chas. B. King  
 nineteen years ago.*

KING MOTOR CAR COMPANY, 1300 to 1324 Jefferson Ave., Detroit, Mich.

New York Agency and Showrooms,  
 Broadway at 52d St.

New York Service Department,  
 244 to 252 West 54th St.

### AGENCY FOR CANADA

King Motor Sales Co. of Canada,  
 London, Ontario

**ATTENTION, AGENTS!** Every KING sold sells others. If we could show the KING to every prospective purchaser of a moderate-priced car, we would sell a year's output monthly. In service and style, it far exceeds any car of its class. Write or wire today for territory.



**MODEL 77**  
 6 Cylinders, 41-2x7 - \$6,000  
**MODEL 66**  
 6 Cylinders, 41-2x5 1-2 - \$5,000  
**MODEL 55**  
 6 Cylinders, 4x5 - \$4,000

Some desirable territory still open.

**AUSTIN AUTOMOBILE CO.**  
 Grand Rapids, Mich.

## STANWELD RIMS

Mechanically correct—easy to operate—perfect in material and workmanship. Used as standard equipment on the better cars.

**THE STANDARD WELDING COMPANY** Cleveland, Ohio

Six Cylinder  
 65 H. P.  
 Equipped  
 with Vulcan  
 Electric Gear  
 Shift

# HAYNES

Four Cylinder  
 40 H. P.  
 Equipped  
 with Vulcan  
 Electric Gear  
 Shift

Our advertising campaign will send a buyer into your showroom more than half convinced that he should own a Haynes; the sale, however, results only from a successful demonstration; it is our firm belief that, as a Haynes dealer, you possess more than a sufficient number of convincing arguments to make every demonstration result in a quick and profitable sale.

May we tell you why we believe this?

**THE HAYNES AUTOMOBILE COMPANY**  
 6 Main St., Kokomo, Indiana.



Its efficiency is proved by scientific facts—not mere claims. Write for Ovington Data D. to **The J. M. Shock Absorber Co.**, 210 S. 17th Street, Philadelphia. Branches in Boston, Hartford, Providence, and all leading cities



will dissolve in the water and stop that leak  
 in the radiator or water  
 jacket

# SE-MENT-OL

ASK YOUR DEALER OR WRITE DIRECT

MANUFACTURED ONLY BY  
**THE NORTHWESTERN CHEMICAL CO.** Marietta, O.

## WARNER AUTO-METER

The Warner is the finest and most highly developed speed and mileage indicator in the world.

**THE WARNER AUTO-METER FACTORY,** Dept. 9, Beloit, Wis.

## GYROSCOPE PRINCIPLE

**The New Jones Speedometer Unaffected by Heat or Cold**

Any motor car maker will equip with it if you state plainly you want nothing else, no matter what speedometer he may list in his catalog as equipment.

Write us for facts, test and experiments that show Jones supremacy beyond question.

**THE JONES SPEEDOMETER—Broadway at 76th Street, NEW YORK**

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# The "Black Eagle" Spark Plug

PATENTED

## 50 Cents Is Enough

The "Black Eagle" Spark Plug has made good because it was designed and manufactured with this result in view.

A person in close touch with the supply and manufacturing ends of the trade was a visitor at our factory recently, and was shown the details of construction, including the machinery, testing, and assembling of the "BLACK EAGLE" Spark Plug. What he said we believe will be of interest to you, as it indicates the effort on our part to supply a high grade plug at a reasonable price. We therefore quote below his impressions.

"I am simply amazed at the workmanship, material, and construction of the 'BLACK EAGLE' Spark Plug. When I saw this plug advertised at a price of 50c to the consumer, I naturally supposed it was a cheap, common, plug such as you occasionally find in jobbing houses on the bargain counter. I am convinced, after seeing these plugs tested, and examining minutely the machine parts which enter into their construction, that no better porcelain spark plug is offered by any one, regardless of the price they ask."

We are not influenced by what our competitors charge for spark plugs! We have ignored price precedent, for the reason that a high grade spark plug can be manufactured and sold at 50c each, and that is enough.

Sent prepaid on receipt of price. Made in all standard threads.

### THE STANDARD CO.

### Torrington, Conn., U. S. A.

**THE HEINZE  
ELECTRIC COMPANY**  
MANUFACTURERS OF  
**Ignition and  
Generating Apparatus**  
**LOWELL, MASS.**

Factory and Main Office:  
LOWELL, MASS.

Sales Office:  
DETROIT, MICH.

**THE "SIX-48" KEETON**  
REPRESENTS  
The "finer points" of EUROPEAN DESIGN  
\$3250 Completely Equipped  
Interesting literature sent on request  
**KEETON MOTOR COMPANY**

467 Lawton Ave.,

Detroit, Mich.

**CATARACT TIRE SERVICE**  
THE 10% OVERWEIGHT TIRES  
Guaranteed for 4000 Miles Service

Measured by Mileage, the Cheapest Shoes Ever Made.  
Clincher and Quick Detachable, Plain and Break-Skid Treads, Regular and Metric Sizes, for All Standard Rims.

**THE CATARACT RUBBER COMPANY**  
Boston, New York, Providence. Factory: WOOSTER, O.

DON'T let rim rust destroy your tires;  
Paint them twice a season with

**THOMAS' ANTI RIM RUST PAINT**

One dollar a can at your dealers, or write us  
**The Anti-Rust Paint Co., Dept. 7, Akron, Ohio**

**DIXON'S MOTOR  
GRAPHITE**

Makes a Motor Run Easier, Faster, and Longer and Saves Lubrication Cost. Write for the Book "Lubricating the Motor," No. 210.

**JOSEPH DIXON CRUCIBLE CO.**

Jersey City

(1)

New Jersey

**Pyrene**  
FIRE  
EXTINGUISHER

FOR YOUR AUTO OR GARAGE

Pyrene is a constant safeguard against fire.

Pyrene is small and compact and may be carried on the dashboard of your car.

Write for Booklet

**PYRENE COMPANY OF NEW ENGLAND**

176 Federal Street, Boston, Mass.

**Herreshoff**  
The Thoroughbred Car.

Electric self-cranks, electrically lighted.  
Four Forward Speeds.

"Six Thirty-Six" Touring  
Car and Roadster - \$1850  
Model 30 Touring Car - \$1350  
Model 30 Roadster - \$1250

Live wire dealers, write for unallotted territory.

**HERRESHOFF MOTOR COMPANY, Detroit, Mich.**

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# Classified Buyers' Guide

A Handy Reference for Purchasers

ACCESSORY MANUFACTURERS AND JOBBERS.

**Auto Parts Co.**, Providence, R. I.  
**Hopewell Brothers**, Newton, Mass.  
 Branch: 1974 Broadway at 67th St., New York.  
**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.  
**Miller, Chas. E.**, 97-103 Reade St., New York.  
 Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 259 Peachtree St., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.  
**Milwaukee Auto Specialty Co.**, 128 Second St., Milwaukee, Wis.  
**Motor Parts Co.**, 185-187 Columbus ave., Boston; 818 No. Broad St., Philadelphia; Springfield, Mass.  
**Northwestern Chemical Co.**, Marietta, O.  
**Waite Auto Supply Co.**, 81 Exchange place, Providence.

ACETYLENE TANKS. (See Tanks.)

ADJUSTERS.

**Vansickle, John A.**, Indianapolis. (Ford Ideal Ball and Socket Joint.)

AIR COMPRESSORS AND TANKS.

**Williams Foundry & Machine Co.**, Akron, O.

AMMETERS AND VOLTMETERS.

**Meyt Electrical Instrument Works**, Penacook, N. H.

AUTOMOBILES. (See Cars.)

AUTOMOBILE SPECIALTIES.

**Cox Brass Mfg. Co.**, Dudley Ave., Albany, N. Y. (Brass Goods.)  
**Motor Specialties Co.**, 2 Cooper Lane, Waltham, Mass.

BALLS AND BALL BEARINGS.

**Boyd, F. Shirley**, 903 Boylston St., Boston. (R. I. V.)  
**Brets Co., J. S.**, 250 W. 54th St., New York. (F. & S.)  
**Wyatt Roller Bearing Co.**, Detroit.  
**Harburg Bros., Inc.**, 1790 Broadway, New York. (S. R. O.)  
**New Departure Mfg. Co.**, Bristol, Conn.  
**Rhineland Machine Works Co.**, 140 W. 42nd St., New York City.  
 Branches: 1254 Michigan Ave., Chicago; 650 Woodward Ave., Detroit; 1424 Vine St., Philadelphia; 220 Motor Mart, Boston.  
**R. I. V. Co.**, 1771 Broadway, New York. (R. I. V.)

BATTERIES.

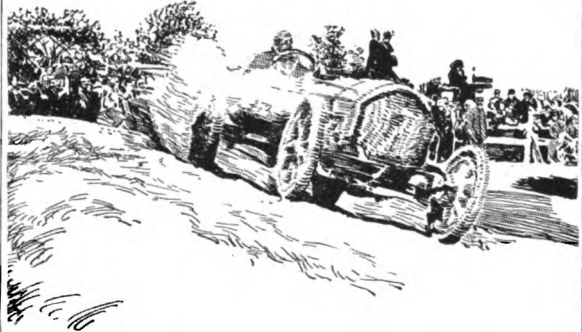
**Burn-Boston Battery Co.**, 19 Doane St., Boston.  
**Electric Storage Battery Co.**, Philadelphia. (Exide.)  
**Gelsner Bros. Storage Battery Co.**, 514 W. 57th St., New York.  
**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City. (J-M.)  
**Waite Auto Supply Co.**, 81 Exchange place, Providence. (Success.)  
**Willard Storage Battery Co.**, 5716 Euclid Ave., Cleveland. (LBA Lighting and Starting.)  
 Branches: 186 West 52nd St., New York; 1191 Woodward Ave., Detroit; 2241 Michigan Ave., Chicago; 243 Monadnock Bldg., San Francisco.

BATTERY EXTINGUISHERS.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.

(Continued on Next Page.)

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## You Come Out Ahead

In the Running Expense of Your  
Automobile When You Use

# Polarine

### THE FRICTION REDUCING OIL

It lubricates perfectly at any temperature, never clogs the feed pipes—leaves practically no carbon. Saves money in repairs.

Use Standard Oil  
Company's Gasoline



STANDARD  
OIL COMPANY  
OF NEW YORK



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| <p><b>Dover Soap Economizer</b></p>  <p>Saves over one-third soap consumption</p> | <p><b>Dover Electric Light Bulb Case</b></p> <p>Safe and Very Compact</p>  <p>Send for 1913 Catalogue</p> | <p><b>DOVER SAVAL MEASURE AND FUNNEL</b></p>  <p>With Automatic Shut-Off Prevents Overflowing Oil Tank</p> |
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**DOVER STAMPING & MFG. CO., Cambridge, Mass.**

**"THE WELDING" COMPANY**

SPRINGFIELD BOSTON HARTFORD HOLYOKE  
BRIDGEPORT SALEM

All Parts of Any Metal Welded and Guaranteed  
ALUMINUM CASES AND CAST IRON CYLINDERS A SPECIALTY

The Easiest Riding Car in the World

**MARMON**

Thoroughly expressive of the highest development of automobile design, materials and construction.

NEW SERIES MARMON "32" F. E. WING MOTOR CAR CO.  
\$2850 to \$4100 "Motor Mart"

**THE MARMON SIX** 12 Columbus Ave., BOSTON  
\$5000 to \$6350 New England Dealers for

**NORDYKE & MARMON CO., Indianapolis, Ind.**

**MOTOR PARTS COMPANY**  
OFFICIAL  
**BOSCH DISTRIBUTOR**

Zenith Carburetor Mohawk Tires Leak-Proof Rings

185-187 Columbus Avenue, BOSTON  
818 No. Broad St., PHILADELPHIA SPRINGFIELD, MASS.

**GOOD YEAR**  
AKRON, OHIO

This name on Automobile Tires and Rubber Accessories signifies inherent qualities of material and workmanship that insure the maximum of service at the minimum of expense.

**THE GOODYEAR TIRE & RUBBER COMPANY, AKRON, OHIO (672)**



*Mea*

**Magneto**  
S. R. O. BALL BEARING

**MARBURG BROS., Inc.,**  
Sole Importers  
Detroit 1790 Broadway, New York Chicago

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## (BUYERS' GUIDE—Continued.)

### BLOW-OUT PATCHES. (See Patches.)

### BODIES, TRUCK.

**Motor Truck Body Co., 320 Franklin St., Detroit.**

### BODIES—WOOD AND METAL.

**Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.**

### BRAKE BANDING OR LINING.

**Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (J-M Non-Burn.)**

**Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Raybestos.)**

**Standard Woven Fabric Co., Framingham, Mass. (Multibestos.)**

Branches: F. Shirley Boyd, 903 Boylston St., Boston; C. D. Schmidt, 276 Canal St., New York City; N. A. Petry Co., 1427 Vine St., Philadelphia; F. E. Sparks, 1430 Michigan Blvd., Chicago; Fred Ward & Son, San Francisco.

### BRAKES.

**Royal Equipment Co., The, 422 Housatonic Ave., Bridgeport, Conn. (Duplex.)**

### BRUSHES, WIRE.

**Williams Foundry & Machine Co., Akron, O.**

### BUMPERS AND FENDERS.

**Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.**

**Sager Co., J. H., 271 South Ave., Rochester, N. Y.**

### CABLES. (See Wires.)

**CARBON REMOVERS. (See Cylinder Cleaning Compound.)**

### CARBURETORS.

**Planhard Mfg. Co., 1790 Broadway, New York. (Planhard.)**

### CARS—ELECTRIC PLEASURE.

**Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)**

**Baker Motor Vehicle Co., Cleveland. (Baker.)**

### CARS—GASOLINE PLEASURE.

**Austin Automobile Co., Grand Rapids, Mich. (Austin.)**

**Cartercar Co., Pontiac, Mich. (Cartercar.)**

**Cole Motor Car Co., Indianapolis, Ind. (Cole.)**

**Empire Automobile Co., Indianapolis, Ind. (Empire, Little Aristocrat.)**

**Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)**

**Henderson Motor Car Co., Indianapolis. (Henderson.)**

**Herreshoff Motor Co., 620 Harper Ave., Detroit. (Herreshoff.)**

**Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)**

**Keeton Motor Co., Detroit. (Keeton.)**

**Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)**

**Knox Automobile Co., Springfield, Mass. (Knox.)**

**Maxwell Motor Co., Inc., Detroit. (Maxwell.)**

**Mercer Automobile Co., 1100 Whitehead Road, Trenton, N. J. (Mercer.)**

**Michigan Motor Car Co., 147 Lay St., Kalamazoo, Mich. (Michigan.)**

**Moline Automobile Co., E. Moline, Ill. (Moline.)**

**National Motor Vehicle Co., 1033 22d St., Indianapolis. (National.)**

**Nordyke & Marmon Co., Indianapolis. (Marmon.)**

**Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)**

**Paige-Detroit Motor Car Co., Detroit. (Paige.)**

(Continued on Next Page.)



## (BUYERS' GUIDE—Continued.)

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)  
 Ree Motor Car Co., Lansing, Mich. (Reo.)  
 Stutz Motor Car Co., Indianapolis. (Stutz.)  
 White Co., The, 828 E. 79th St., Cleveland. (White.)  
 Branches: 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.  
 Willys-Overland Co., Toledo, O. (Overland.)

## CARS—STEAM PLEASURE.

White Co., The, 828 E. 79th St., Cleveland. (White.)  
 Branches: See Cars—Gasoline Pleasure.

## CARS—GASOLINE COMMERCIAL.

Adams Bros. Co., Findlay, O. (Adams.)  
 Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)  
 Blair Mfg. Co., Newark, O. (Blair.)  
 Brown Commercial Car Co., Peru, Ind. (Brown.)  
 Cartecar Co., Pontiac, Mich. (Cartecar.)  
 Dart Manufacturing Co., Waterloo, Ia. (Dart.)  
 Driggs-Seabury Ordnance Corp., Sharon, Penn. (Vulcan.)  
 Federal Motor Truck Co., Junction and Leavitt Sts., Detroit. (Federal.)  
 Garford Co., Elyria, O. (Garford.)  
 General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)  
 Branches: New York, Chicago, Boston, Philadelphia, Kansas City.  
 Gramm-Bernstein Co., Lima, O. (B. A. Gramm's.)  
 Knox Automobile Co., Springfield, Mass. (Knox and Martin Tractor.)  
 Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)  
 Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)  
 Ree Motor Car Co., Lansing, Mich. (Reo.)  
 Sullivan Motor Car Co., 1707 East Ave., Rochester, N. Y. (Sullivan.)  
 Willys-Overland Co., Toledo, O. (Overland.)

## CARS—ELECTRIC COMMERCIAL.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)  
 Atlantic Vehicle Co., Factory, Newark, N. J.; 1600 Broadway, New York City; 10 Postoffice Sq., Boston. (Atlantic.)  
 Baker Motor Vehicle Co., Cleveland. (Baker.)  
 Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)  
 Branches: 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.  
 General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)  
 Branches: See Cars—Gasoline Commercial.  
 General Vehicle Co., Long Island City, N. Y. (G. V.)

## CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

Cartecar Co., Pontiac, Mich. (Cartecar.)  
 Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)  
 Branches: See Cars—Electric Commercial.  
 Knox Automobile Co., Springfield, Mass. (Knox and Martin Tractor.)  
 White Co., The, 828 E. 79th St., Cleveland. (White.)  
 Branches: See Cars—Gasoline Pleasure.  
 Willys-Overland Co., Toledo, O. (Overland.)

## CATALOGUE SYSTEMS.

Catalogue Systems Co., Fisher Bldg., Chicago, Ill.

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Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

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**BOSCH**The  
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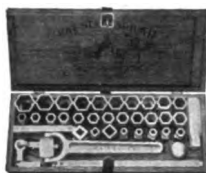
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Weed Chain Tire Grip Co., 28 Moore St., New York.

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Boyd, F. Shirley, 903 Boylston St., Boston. (Baldwin.)  
Miller, Chas. E., 97-103 Reade St., New York. (Bramp-ton.)  
Branches: See Accessory Manufacturers and Jobbers.)

#### CLOCKS FOR DASHBOARDS, ETC.

Boston Clock Co., 16 State St., Boston.  
Chelsea Clock Co., 16 State St., Boston.

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Bretz Co., J. S., 250 W. 54th St., New York. (Hartford Cone.)

#### COILS.

Helme Electric Co., Lowell, Mass.  
New York Coil Co., 338 Pearl St., New York City.

#### CYLINDER CLEANING COMPOUND.

Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.  
Milwaukee Auto Specialty Co., 128 Second St., Milwaukee.

Northwestern Chemical Co., Marietta, O. (Carbonox.)  
Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Carbon Remover.)  
Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburgh, Providence, San Francisco, Seattle, St. Louis and St. Paul.

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Northwestern Chemical Co., Marietta, O. (Fire-Fly.)  
Pyrene Co. of New England, 176 Federal St., Boston.

#### FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

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Brown Co., Inc., Chas. D., 49 Federal St., Boston. (Vel-lumoid.)  
Shawver Co., Springfield, O.

#### GAUGES.

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Tire Pressure and Gasoline Tank.)  
Branches: In all principal cities.

#### GEARS, STEERING.

Ross Gear & Tool Co., 794 Heath St., Lafayette, Ind.

#### GUNS, GREASE. (See Oil Pumps.)

#### HORNS.

Dean Electric Co., Elyria, O. (Tuto.)  
Kent Mfg. Works, Atwater, 4937 Stenton ave., Wayne Junction, Philadelphia. (Monoplex.)  
Motor Specialties Co., 2 Cooper Lane, Waltham, Mass (Fogg.)

#### HOUSES, PORTABLE STEEL.

Kolb Sales Co., 1790 Broadway, New York. (Ruby.)  
(Continued on Next Page.)



(BUYERS' GUIDE—Continued.)

IGNITION EQUIPMENT.

Kent Mfg. Works, Atwater, 4937 Stenton ave., Wayne Junction, Philadelphia.

INSULATION.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

JACKS, ETC.

Shawver Co., Springfield, O.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)  
Branch: 1974 Broadway, New York.

LICENSE NUMBER BRACKETS.

National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.  
Branches: In all principal cities.

LIGHTING SYSTEMS, ELECTRIC.

Apple Electric Co., Dayton, O. (Apico.)  
Dean Electric Co., Elyria, O. (Dynalux.)  
Remy Electric Co., Anderson, Ind. (Remy.)

LOCKS, AUTOMOBILE.

Bracelet Auto Lock Co., 32 No. Clark St., Chicago.

LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York. (Colonial.)  
Branches: Boston, Fall River, Philadelphia.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)  
Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagle-line No-Karbon.)

Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)  
Branch: 143 No. Wabash Ave., Chicago.

Haws, Geo. A., 142-144 Front St., New York. (Panhard.)  
Branch: 899 Boylston St., Boston.

Indian Refining Co., 17 Battery Place, New York. (Distributors of Havoline Oil.)  
Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Building, Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.

Invader Oil Co., 80 Broad St., New York. (Invader.)  
Branches: 284 Columbus Ave., Boston; 113 Arch St., Philadelphia; 3556 11th St., N. W., Washington, D. C.

Miller, Chas. E., 97-103 Reade St., New York. (Pan-American.)  
Branches: See Accessory Manufacturers.

New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)

Northwestern Chemical Co., Marietta, O. (Gear-Silence.)

Standard Oil Co., New York. (Polarine.)  
Branches: In all cities.

Texas Company, The, 7 West St., New York.  
Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)  
Branches: 49 Federal St., Boston; 29 Broadway, New York; Fourth and Chestnut Sts., Philadelphia; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.; Fisher Bldg., Chicago; Ford Bldg., Detroit; Indiana Pythian Bldg., Indianapolis.

Valvoline Oil Co., 27 State St., Boston. (Valvoline.)

MAGNETOS AND SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York.  
Branches: 119-121 E. 24th St., Chicago; 1250 Wood-  
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| Detroit---972 Woodward Ave.     | San Francisco---1028 Geary St.    |
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Helmse Electric Co., Lowell, Mass. (Heco.)  
Marburg Bros., 1790 Broadway, New York. (Mea.)  
Remy Electric Co., Anderson, Ind. (Remy.)  
Splitdorf Electrical Co., 98 Warren St., Newark, N. J.  
Branches: 10-20 W. 63rd St., New York; 1110 S. Michigan Ave., Chicago; 180-182 Massachusetts Ave., Boston; 1028 Geary St., San Francisco; 972 Woodward Ave., Detroit; 1228 S. Olive St., Los Angeles, Cal.; S. W. Corner Cherry and Juniper Sts., Philadelphia; 1823 Grand Ave., Kansas City; 1628 Broadway, Seattle, Wash.; London, Eng.; Buenos Aires.

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New York Coil Co., 338 Pearl St., New York City.

## MEASURES.

Dover Stamping &amp; Manufacturing Co., Cambridge, Mass. (Auto and Savol.)

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Kent Mfg. Works, Atwater, 4937 Stenton ave., Wayne Junction, Philadelphia. (Kent Pocket.)  
Northwestern Chemical Co., Marietta, O. (Hydrometers and Thermometers.)

## MIXING DEVICES, GASOLINE.

Royal Equipment Co., 422 Housatonic Ave., Bridgeport, Conn. (Gyrex.)

## MOTORCYCLES AND SUPPLIES.

Miami Cycle &amp; Manufacturing Co., 320 Hanover St., Middletown, O. (Flying Merkel.)

## MOTOR STARTERS.

Apple Electric Co., Dayton, O. (Aplco.)  
Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.  
Remy Electric Co., Anderson, Ind. (Remy.)

## PACKING, FIRE.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

## PAINT, ANTI-RUST.

Anti-Rust Paint Co., Dept. 7, Akron, O. (Thomas.)  
Northwestern Chemical Co., Marietta, O. (Never-Rust.)

## PATCHES.

Invincible Puncture Proof Tire Co., 53 Sabin St., Providence. (Invincible.)  
National Motor Supply Co., 1911 Euclid Ave., Cleveland.

## POLISH.

International Metal Polish Co., Quill St. and Belt R. R., Indianapolis, Ind. (Blue Ribbon.)  
Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.  
Northwestern Chemical Co., Marietta, O.

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Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.

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Brown Co., Syracuse, N. Y. (Brown Impulse.)  
 Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.  
 Dewey-Anderson Co., Toledo, O. (Dewey Power.)  
 Shawver Co., Springfield, O.

## RADIATOR CONNECTORS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

## RIMS—REMOVABLE AND DETACHABLE.

Boyd, F. Shirley, 903 Boylston St., Boston. (Dorian.)  
 Firestone Tire & Rubber Co., Akron, O.  
 Branches: In all principal cities.  
 Standard Welding Co., Cleveland. (Stanweld.)  
 United States Tire Co., Broadway and 58th St., New York. (Continental and Whittlesey Demountable.)  
 Branches: New York, Chicago, San Francisco.

## ROAD BUILDING MATERIALS.

Barrett Manufacturing Co., New York. (Tarvia.)  
 Branches: Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburg, Cincinnati, Kansas City, Minneapolis, New Orleans, Seattle, London, Eng.; Montreal, Toronto, Winnipeg, Vancouver, Can.; St. John, N. B.; Halifax, N. S.

## SHIELDS, MOTOR.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (Asbestos.)

## SHIMS, ETC.

Rhineland Machine Works Co., 140 W. 42nd St., New York City. (Lindhe Laminated.)  
 Branches: See Balls and Ball Bearings.

## SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.

Boyd, F. Shirley, 903 Boylston St., Boston.  
 Hudson Export and Import Co., 140 W. 42nd St., New York City. (A. V.)  
 J. M. Shock Absorber Co., 210 So. 17th St., Philadelphia. (J. M.)  
 Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

## SOAPS.

Hopewell Bros., Newton, Mass. (Paos.)  
 Branch: 1974 Broadway, New York.  
 Northwestern Chemical Co., Marietta, O. (Dermalene.)  
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 Branches: See Magnetos and Magneto Supplies.  
**Helme Electric Co., Lowell, Mass. (H. E. Co. Priming.)**  
**Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.**  
**Mosler, A. R., & Co., P. O. Box M, Mt. Vernon, N. Y. (Spit Fire.)**  
**Rhineland Machine Works Co., 140 W. 42nd St., New York City.**  
 Branches: See Balls and Ball Bearings.  
**Splitdorf Electrical Co., 98 Warren St., Newark, N. J.**  
 Branches: See Magnetos and Magneto Supplies.  
**Standard Co., The, Torrington, Conn. (Black Eagle.)**

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**Jones Speedometer, New Rochelle, N. Y.**  
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**Northwestern Chemical Co., Marietta, O. (Hydrometers and Thermometers.)**  
**Service Recorder Co., 2245 East 105th St., Cleveland. (Servis.)**  
**Stewart-Warner Speedometer Corp., Chicago. (Auto-Meter.)**  
 Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2430 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330 1/2 North Illinois St., Indianapolis; 1613 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1903 Broadway, New York; 302 N. Broad St., Philadelphia; 5040 Kirkwood Ave., Pittsburg; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

**SPRINGS FOR AUTOMOBILE SUSPENSION.**

**Marburg Bros., Inc., 1790 Broadway, New York. (Marburg-Hagen.)**  
**Perfection Spring Co., No. 1 Plant, 2414 Superior Ave., N. W.; No. 2 Plant, East 65th and Central Ave., Cleveland.**

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**Standard Welding Co., Cleveland.**

**STORAGE SYSTEMS—GASOLINE AND OIL.**

**Scaife & Sons Co., Wm. B., Pittsburg, Penn.**  
 Branch: New York City.

**TANKS, ACETYLENE GAS.**

**Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Lite.)**  
 Branches: See Cylinder Cleaning Compound.  
 (Continued on Next Page.)



(BUYERS' GUIDE—Continued.)

**TANKS FOR FUEL AND WATER.**

**Sealife & Sons, Wm. B.,** Pittsburg, Penn.  
Branch: New York City.

**TANKS, TIRE INFLATING.**

**Frest-O-Lite Co.,** 271 East South St., Indianapolis.  
(Baby Tire Filler, The Emancipator.)  
Branches: See Cylinder Cleaning Compound.

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**Johns-Manville Co., H. W.,** Madison Ave. and 41st St.,  
New York City.

**THERMOS CASES.**

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**Firestone Tire & Rubber Co.,** Akron, O.  
Branches: See Rims—Removable and Detachable.  
**Shawver Co.,** Springfield, O. (Tools.)

**TIRE CASES.**

**Hopewell Brothers, Newton, Mass.** (Hopewell.)  
Branch: 1974 Broadway, New York.

**TIRE CHAIN GRIPS.** (See Chains.)

**TIRE PRESERVATIVES AND PROTECTORS.**

**Northwestern Chemical Co.,** Marietta, O. (Tire-Lac.)

**TIRES—CASINGS AND INNER TUBES.**

**Braender Rubber & Tire Co.,** Rutherford, N. J.  
(Braender.)

**Cataract Rubber Co.,** Wooster, O. (Cataract.)  
Branches: Boston, New York, Providence.  
**Dayton Rubber Mfg. Co.,** Dayton, O. (Dayton Airless.)  
**Firestone Tire & Rubber Co.,** Akron, O. (Firestone.)  
Branches: See Rims—Removable and Detachable.  
**Gaulois Tire Co.,** 1926 Broadway, New York. (Gaulois.)  
**Goodyear Tire & Rubber Co.,** Madison St., Akron, O.  
(No-Rim-Cut.)  
Branches: In all principal cities.

**United States Tire Co.,** Broadway and 58th St., New  
York. (Continental, G & J, Hartford, Morgan &  
Wright.)  
Branches: See Rims—Removable and Detachable.

**TIRES—CUSHION.**

**Cataract Rubber Co.,** Wooster, O. (Cataract.)  
Branches: Boston, New York, Providence.  
**Firestone Tire & Rubber Co.,** Akron, O. (Firestone.)  
Branches: See Rims—Removable and Detachable.  
**Mots Tire & Rubber Co.,** The, Akron, O. (Electric  
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Branches: Boston, New York, Philadelphia, Pitts-  
burg, Chicago, Kansas City, Detroit, Cleveland, Los  
Angeles.

**TIRES—SOLID AND COMMERCIAL.**

**Firestone Tire & Rubber Co.,** Akron, O.  
Branches: See Rims—Removable and Detachable.  
**Goodrich Co., B. F.,** Akron, O. (Goodrich.)  
**Mots Tire & Rubber Co., The,** Akron, O. (Motz.)  
Branches: See Tires—Cushion.  
**Polack Tyre and Rubber Co.,** 246 W. 59th St., New York  
City. (Polack.)  
**United States Tire Co.,** Broadway and 58th St., New  
York.

(Continued on Next Page.)

When Writing to Advertisers, Please Mention The Automobile Journal.

# Broadway Central Hotel

Cor. Third Street

## IN THE HEART OF NEW YORK

Special attention given  
to Ladies unescorted

OUR TABLE is the foundation of  
our enormous business.

American Plan, \$2.50 upwards

European Plan, \$1.00 upwards

Send for Large Colored Map and Guide of  
New York, FREE

TILLY HAYNES, Proprietor

DANIEL C. WEBB, Mgr.

Formerly of Charleston, S. C.

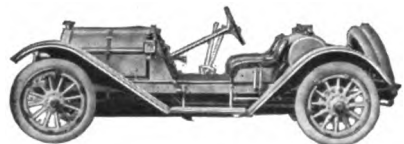
The Only New York Hotel Featuring  
AMERICAN PLAN

Moderate Prices

Excellent Food

Good Service

Type 35  
Series J  
Raceabout  
Guaranteed  
Speed—Mile in  
51 Seconds



# MERCER

The car which most perfectly meets the medium weight  
demand. Dealers should carefully consider this fact.

Write today regarding unallotted Territory.

MERCER AUTOMOBILE CO., 1100 Whitehead Road  
TRENTON, N. J.

# BRAENDER TIRES & TUBES

Are of the highest quality and the cheapest on mileage. They are  
built to last. Send for price list and particulars.

BRAENDER RUBBER & TIRE CO.

Main Office and Factory

RUTHERFORD, N. J.

# VALVOLINE OIL CO.

Heavy, Medium and Light

## Automobile Oils

27 STATE STREET, BOSTON, MASS.





## MULTIBESTOS

The Brake Lining of Quality.

**BRINGS**

Sales to the Dealer  
Safety to the Owner  
Service all Around

Adopted after test as regular equipment on Quality Cars. Woven of the purest of asbestos and treated by an exclusive formula. Multibestos has the highest co-efficient of friction and wears most uniformly through the longest life.

**Standard Woven Fabric Co., Framingham, Mass.**

SALES BRANCHES:

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| Philadelphia, 1427 Vine St.          | Boston, 908 Boylston St.     |
| San Francisco, Fred Ward & Son, Inc. |                              |

# Hoffecker

*"The Steady Hand"*

## Speedometer


Accurate, durable—the one speedometer with a daily trip register that can be set at any mileage at any time.

**THE HOFFECKER COMPANY**

Motor Mart—Main Offices—Boston, Mass. **PRICES \$25 to \$135**

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| 1779 Broadway . . . New York  | 1217 Huron Road . . . Cleveland      |
| Sherridan & Palma, Pittsburgh | Cor. Broad & Race Sts., Philadelphia |



Discard the Hand Pump. Join the Satisfied Army. Get a

## Brown Impulse Tire Pump

Write for information to

**The Brown Company,**

1075 S. Clinton St.,                      Syracuse, N. Y.

INSIST ON GETTING

# Colonial Motor Oil

No substitute "just as good"

**Borne, Scrymser Company**

NEW YORK    BOSTON    FALL RIVER    PHILADELPHIA

**F. SHIRLEY BOYD**

903 Boylston St.                      Boston, Mass.

Dorian Demountable Rims.  
Supplementary Spiral Springs.                      R. I. V. Ball Bearings.

## CAMERON CARS

# \$975

All Up-To-Date Features

Four cylinder, water cooled, 30 H. P. Four forward speeds. 112 in. wheelbase. Left hand drive, centre control. Starts from seat. Pointed hood, beautiful lines and finish. Equipment unsurpassed at the price.

Write for full details and terms to agents

THE CAMERON MANUFACTURING CO.    Beverly, Mass.

## (BUYERS' GUIDE—Concluded.)

- Branches:** See Rims—Removable and Detachable.
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- Springfield Metal Body Co.,** 20 Medford Ave., Springfield, Mass.
- TROUBLE FINDERS.**
- Hopewell Brothers,** Newton, Mass. (Vibrator.)  
Branch: 1974 Broadway, New York.
- TRUCKS AND TRACTORS—(See Cars, Commercial.)**
- TRUNK RACKS.**
- Connecticut Steel & Wire Co.,** Hartford, Conn.
- TUBING, GAS.**
- Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City.
- TURNTABLES.**
- Beach Co.,** T. O., 108 Ottawa St., St. Johns, Mich. (Beach.)
- UNIVERSAL JOINTS.**
- Brets Co.,** J. S., 520 W. 54th St., New York. (Hartford.)
- VALVE GRINDERS.**
- Wall, J. H.,** 290 Hope St., Bristol, R. I. (Ford.)
- VALVE LIFTERS.**
- Winsor Manufacturing Co.,** Providence, R. I.
- VENTILATORS.**
- Wattles, C. B.,** 441 Butler Exchange, Providence, R. I. (Excelsior Adjustable.)
- VOLTMETERS—(See Ammeters.)**
- VULCANIZERS.**
- National Motor Supply Co.,** 1911 Euclid Ave., Cleveland. (Garage and Individual.)  
Branches: In all principal cities.  
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**Williams Foundry & Machine Co.,** Akron, O.
- WELDING, AUTOGENOUS.**
- Autogenous Welding Equipment Co.,** Springfield, Mass.
- WELDING OUTFITS.**
- Prest-O-Lite Co.,** 309 W. South St., Indianapolis. (Prest-O-Welder.)  
Branches: See Cylinder Cleaning Compound.
- WELDING STEEL.**
- Standard Welding Co.,** Cleveland.
- WHEELS.**
- McCue Co.,** The, Buffalo, N. Y. (Wire.)
- WIRE MECHANISM.**
- Brets Co.,** J. S., 250 W. 54th St., New York. (Bowden.)
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- Allen Wrench and Tool Co.,** Providence, R. I. (Allen Friction Socket Sets.)  
**Coes Wrench Co.,** Worcester, Mass.  
**Cutter, George A.,** Taunton, Mass.  
**Walworth Manufacturing Co.,** Boston. (Stillson.)

When Writing Advertisers, Please Mention The Automobile Journal.





**Not only has the Pierce-Arrow turned the tide of imported cars so that there are to-day far less in proportion than some years ago—not only that, but the Pierce-Arrow in American hands has invaded Europe, giving greater satisfaction to its owners than a native car on its native heath.**

**The Pierce-Arrow Motor Car Company, Buffalo, N. Y.**



LET THE LAMP  
OF EXPERIENCE  
LIGHT YOUR WAY

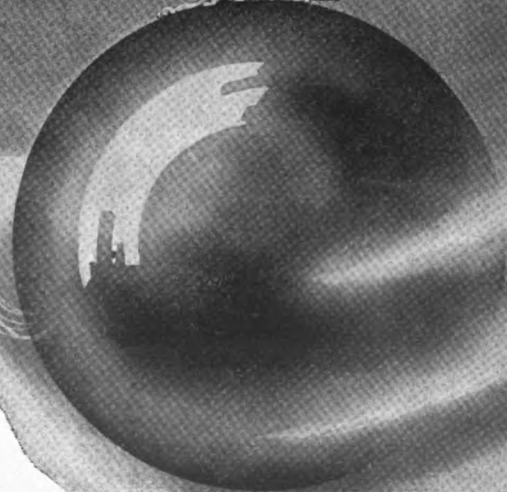
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&

S

Ball

Bearings

**ABRETZ**  
**COMPANY**  
SOLE IMPORTERS  
250 West Fifty-fourth  
New York





VOL. XXXVI.

NO. 7.

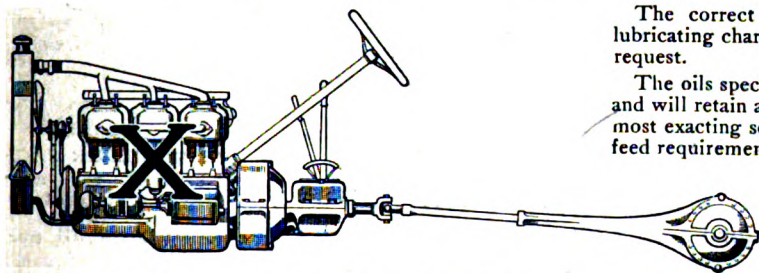
# AUTOMOBILE JOURNAL

\$1.00 the year  
10 cents the copy

PAWTUCKET R.I.

November 10, 1913

## Lost power means worn metal



"X" indicates the motor where your power develops. But

A great deal of the power developed in combustion chambers never gets to the rear axles.

*Most of the power lost on the way is taken up by friction.*

If motorists understood better the costly results of unnecessary friction they would select their lubricating oil with the greatest care.

*Only oil of the very highest lubricating qualities can properly protect the moving parts.*

*Only oil whose "body" or thickness, is suited to your feed system can properly reach the friction points.*

Correct "body" is quite as important as correct quality. And correct "body" cannot be determined by guess.

Motor-constructions differ widely. Before the correct "body" for your feed requirements can be determined, the construction of your motor *must* be known and carefully considered.

To this end, every year we analyze the motor-construction of each of the season's models. Guided by this analysis and by practical experience we determine the correct grade of Gargoyle Mobiloil for each make of car.

The correct oil for each car we then specify in our lubricating chart, a copy of which will be mailed you on request.

The oils specified have extraordinary wearing qualities and will retain an efficient lubricating "body" under the most exacting service demands. Their "body" suits the feed requirements of each car they are recommended for.

This lubricating chart represents the professional advice of a Company whose authority on scientific lubrication is unquestioned the world over—The Vacuum Oil Company.

*If you use oil of lower lubricating quality or of less correct "body" than that specified for your car, your motor must face loss of power, unnecessary friction and ultimate serious damage.*

A booklet, containing our complete lubricating chart and points on lubrication, will be mailed you on request.



# Mobiloil

A grade for each type of motor.

The various grades, refined and filtered to remove free carbon, are:

Gargoyle Mobiloil "A"  
Gargoyle Mobiloil "B"  
Gargoyle Mobiloil "D"  
Gargoyle Mobiloil "E"  
Gargoyle Mobiloil "Arctic"

They are put up in 1 and 5 gallon *sealed cans*, in half-barrels and barrels. *All are branded with the Gargoyle, which is our mark of manufacture.* They can be secured from all reliable garages, automobile supply stores, and others who supply lubricants.

VACUUM OIL COMPANY, Rochester, U. S. A.

#### BRANCHES:

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Ford Bldg.

BOSTON  
49 Federal St.

NEW YORK  
29 Broadway

CHICAGO  
Fisher Bldg.

PHILADELPHIA  
4th & Chestnut Sts.

INDIANAPOLIS  
Indiana Pythian Bldg.

MINNEAPOLIS  
Plymouth Building

*Distributing warehouses in the principal cities of the world.*



# The Largest Automobile Supply House in America

## The Miller Automobile Jack

The MILLER AUTOMOBILE JACK is a single acting, automatic-lowering jack, designed especially for automobile use and is adapted to the factory or garage as well as to be carried as a part of the equipment on motor cars. The MILLER JACK is constructed of the best material, no complicated or loose fitting parts to get out of order, and in material, workmanship and finish, the MILLER JACK is not exceeded, if indeed, it is equalled by any other jack. It is a high grade and one of the finest finished jacks on the market.

The short stroke makes lifting easy and rapid. Automatically locks while operating, thereby doing away with any possibility of slipping or dropping the load.

Fitted with a simple and convenient trip lever for reversing. Height, 11 inches. Raises 6 inches. Weight, 9 lbs. Capacity, 1 ton.

We guarantee this jack for 12 months, and at the price, it is the best value ever offered to the automobile trade.

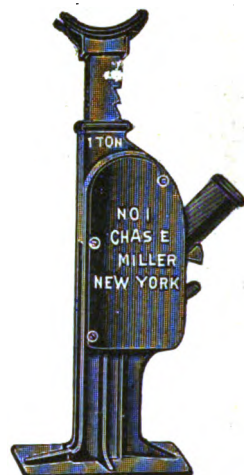
We are in a position to quote a special price to manufacturers, jobbers and dealers who buy in quantities.

**CAPACITY: ONE TON.**

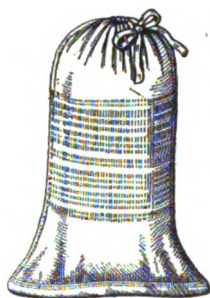
The List Price of the MILLER JACK,  
guaranteed for twelve months.....\$3.00 each

Weight, packed for Parcel Post, 10 lbs.

**AGENTS WANTED. ADDRESS JACK DEPARTMENT.**



**THE MILLER JACK**  
Designed for any size and style of automobile and is adapted for all purposes.



**TUBE BAG**

**25c A REAL INNER TUBE BAG FOR 25c**

MAILED TO ANYONE IN ANY PART OF THE UNITED STATES  
MADE OF HEAVY NAPPED CLOTH

Will keep your inner tube free from grit and dirt, and from scratching or chafing while in the tool box or luggage carrier. Answers the same purpose as tube bags which cost \$1.50 or more. Will hold one tube 5 inches or smaller. Protect your tubes and reduce your tire expense. In ordering, state size of tube.

Send 25c, in stamps or coin, and tube bag will be sent to you by return mail

Send your name and address NOW with 4 cents postage (to cover cost of mailing) for a free copy of our Big 256 Page Catalog

# Chas. E. Miller

Manufacturer, Jobber, Exporter, and Importer  
97-99-101-103 Reade St., New York City

Established 1896

**ORDER FROM NEAREST BRANCH, ADDRESS CHAS. E. MILLER**

**NEW YORK CITY**  
97-103 Reade St.  
**NEW YORK CITY**  
924 Eighth Avenue  
**NEW YORK CITY**  
2782 Broadway  
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1421 Bedford Avenue

**BUFFALO, N. Y.**  
824 Main Street  
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**HARTFORD, CONN.**  
274 Trumbull St.  
**DETROIT, MICH.**  
227-229 Jefferson Ave.  
**CLEVELAND, O.**  
1829 Euclid Avenue  
**PHILADELPHIA, PA.**  
318 North Broad St.

**ATLANTA, GA.**  
259 Peachtree Street  
**NEW ORLEANS, LA.**  
601-603 Baronne St.  
**NEWARK, N. J.**  
274 Halsey Street



# Ask Dun's, Bradstreet's Or Your Own Banker

**NOW, MORE THAN EVER BEFORE**, it behooves the dealer and the buyer to look carefully to the financial stability of the automobile manufacturer whose car he contemplates owning.

**THERE HAVE BEEN SOME** occurrences of late that should serve as a warning in this regard. On the other hand, there hasn't been a failure that wasn't scheduled. They were fore-ordained from the first—inevitable.

**SOME WERE OVERDUE**, in fact. Thanks to the splendid demand for cars which we and other responsible concerns were unable to supply in full, some of them were accorded a longer lease of life than their product or experience or financial backing entitled them to.

**THERE WAS NO EXCUSE**, however, for any buyer being in ignorance of what impended. That was easily foreseen.

**LET US SUGGEST** that now, you who are in the market for a car, look into this matter as it deserves. You owe it to yourself—and us.

**ASK BRADSTREET'S OR DUN'S.** Or if you are not a subscriber, ask your Banker to investigate and inform you. He will do it gladly.

**ASK HIM WHICH ARE** the five financially strongest automobile manufacturers.

**YOU WILL FIND** that the Maxwell Motor Company is one of the five—and it will not be fifth in point of stability either.

**HAVE HIM ANALYZE** the latest financial statements of these five strongest and tell you which have the greatest amount of assets in proportion to liabilities—including bonded indebtedness, etc., of course. We think he'll tell you the Maxwell Motor Company is one of the leaders.

**PERHAPS YOU DIDN'T KNOW**—there's been so much confusion in this matter—that the Maxwell Motor Company has no connection whatsoever with the late Maxwell-Briscoe Company except that this concern purchased, through the U. S. Courts, all the assets, not only of that, but of several other concerns.

**WE STARTED WITH A CLEAN SLATE**—with plants worth many millions, with ample cash on hand to take care of our manufacturing operations, etc.

**WE HAVE NO BONDED INDEBTEDNESS**—no outstanding notes or debts of any kind except current open accounts not yet due.

**AND TODAY WE ARE** nine months old with orders on our books for more than thirty thousand cars.

**HAS THAT RECORD EVER been surpassed** in this industry? We submit the account of our stewardship—ask Bradstreet's, Dun's or your Banker for further particulars regarding the operations and stability of this company.

**THEN YOU'LL FEEL SECURE** on that point and, when you compare the cars as carefully, there will be only one answer, "Yours will be a Maxwell."

## Maxwell Motor Company (Inc.)

Detroit, Michigan

Dealers and Service Everywhere





# COES

## THE Wrench Supreme

Strength without bulk or clumsiness.

Ease of handling without slipping or bruising.

Perfect balance and right grip

Everything the motorist desires in a wrench is to be found in the "COES" AUTOMOBILE MODEL, and you will never know perfect wrench service until you pin your faith to it.

It stands to reason that the 5 per cent. more you pay for a "COES" wrench goes for 60 per cent. more quality and service—put this wrench in the tool kit and shop. You will get your money's worth.

Send for Literature Now.

---

### Coes Wrench Co.

WORCESTER, MASS.

J. C. McCARTY & CO.,  
21 Murray St., New York City  
JOHN H. GRAHAM & CO.,  
113 Chambers St., New York City

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# Mosler Vesuvius

## Plugs

Insist

Upon

Mosler

Spit Fire

RED TAG

Plugs



PACKED IN THIS BOX  
& TAGGED  
FOR YOUR PROTECTION

IT

**GUARANTEES  
Genuine Platinum Point**

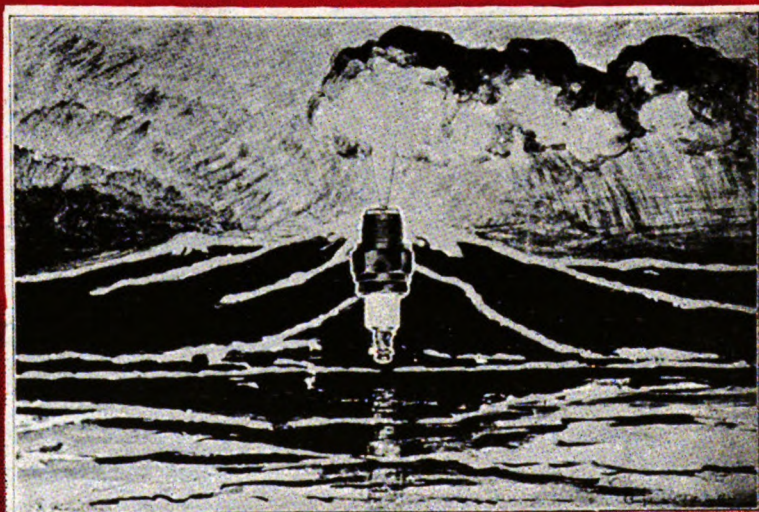
**Energetic Ignition      Greater Power**

**WE CARRY IN STOCK A PLUG FOR EVERY  
INTERNAL COMBUSTION ENGINE BUILT.**

SOLD BY THE LEADING DEALERS

**A.R. MOSLER & CO., MT. VERNON, N.Y.**

003



AS POWERFUL AND AS INDESTRUCTIBLE AS THE FIRES OF VESUVIUS



*Absolutely Gas Tight*

*Has No Equal*

*For Speed and Power*

*Can Be Taken Apart Easily*

*And Reassembled*

*Absolutely Gas Tight*

*The Stone-Insulated Plug*

*Par Excellence*

*Will Outlast Your Motor*

*Made to fit any Engine*

*any Thread*

**A.R. MOSLER & CO.,**

**MT. VERNON, N.Y.**





# INVADER OIL

**I**NVADER OIL is the best —not because we say so, or because it is our product, or because we are anxious to sell it, *but because the oil itself possesses certain definite concrete chemical tests which prove it to be better than any other.*

With the same range of fire tests, and the same range of viscosities that other oils have, Invader Oil is lighter in color and lighter in gravity.

*This simply means that Invader Oil is freer from carbon than other oils of equal body*

|                     |  |                     |
|---------------------|--|---------------------|
| <b>NEW YORK</b>     |  | <b>92 Pearl St.</b> |
| <b>PHILADELPHIA</b> |  | <b>113 Arch St.</b> |

#### FACTORIES

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| <b>BOSTON</b>       | <b>284 Columbus Ave.</b> |
| <b>WASHINGTON</b>   | <b>512 Kenois Bldg.</b>  |
| <b>PHILADELPHIA</b> | <b>113 Arch St.</b>      |

#### BRANCHES

# INVADER OIL

Lessees of Cha

**Main Office, 76 Broad St., N. Y.**

When Writing to Advertisers, Please Mention The Automobile Journal.





# INVADER OIL

*and consistency, and is therefore better for automobile lubrication.*

The sales of Invader Oil have increased 212 per cent. during the past eight months over the corresponding period of last year. This is an indication that these facts are being appreciated in an unusually substantial manner.

*Territorial agents are in a position to fill orders as promptly and at the same prices as the main office, or any branch of the Invader Oil Co.*

**COMPANY, Inc.**

Kellom & Co.

**N. Y. City Branch, 1906 Broadway**

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| San Francisco, Cal. | W. D. Newerl Rubber Co. |
| Tacoma, Wash.       | Union Motor Car Co.     |
| Omaha, Neb.         | Lining Implement Co.    |
| Detroit, Mich.      | Boyer-Campbell Co.      |
| St. Louis, Mo.      | Beck & Corbett Iron Co. |
| Chicago, Ill.       | Motor Car Supply Co.    |
| Salina, Kansas      | Lee Hardware Co.        |
| Kansas City, Mo.    | Amer. Lub. & Supply Co. |
| Portland, Me.       | James Bailey Company    |





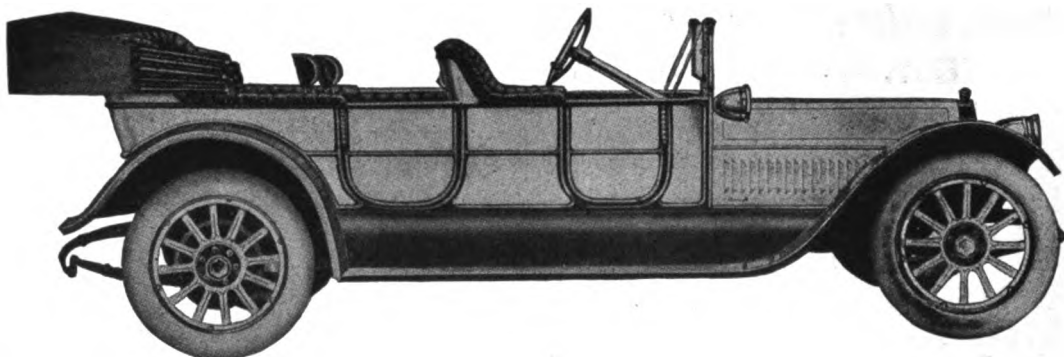
## Our Exclusive Feature

We will (at small extra cost) furnish  
our Regular Models with the



# AUSTIN Two-Speed Axle

This axle provides two different gear ratios, both on direct drive, and in combination with a three-speed transmission gives six speeds forward and two reverse.



Model "77" has a Regular Direct Drive of 3 1-2 to 1, and a Special Direct Drive of 2 to 1.  
Model "55" has a Regular Direct Drive of 4 1-2 to 1, and a Special Direct Drive of 3 to 1.

The Regular Direct Drive provides ample power and exceptional ease of control for hills, bad roads and crowded city traffic.

The Special Direct Drive for normal conditions, shows a gain of over 50% in mileage for the same fuel consumption and motor speed, eliminates the noise, wear and tear of running the motor at excessive speeds, adds materially to the life and durability of the car and pleasure of riding.

|   |   |   |           |
|---|---|---|-----------|
| Model "77" Six Cylinders, 4 1-2 x 7     | - | - | \$6000.00 |
| Model "66" Six Cylinders, 4 1-2 x 5 1-2 | - | - | \$5000.00 |
| Model "55" Six Cylinders, 4 x 5         | - | - | \$4000.00 |

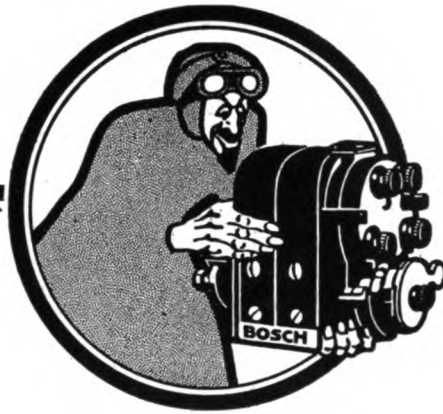
**MORE NEW, IMPROVED and DISTINCTIVE FEATURES** than any other car. Two-speed rear axle, high pressure air self-starting system, complete electric lighting system, left hand steer, center control, two-spark magneto, four-speed transmission, both brakes controlled by foot pedals.

*Write for complete description and any information you may desire in regard to our two-speed axle.*

## Austin Automobile Company

GRAND RAPIDS, MICHIGAN





# BOSCH DESIGN

## Why it interests you

THE design of all Bosch Products has been along those channels which assure the simplest and most satisfactory product for performing the proper functions of an unexcelled ignition system.

That is why a Bosch-Equipt car is a reliable car, insofar as the ignition is concerned. As the most vital part of the engine, ignition should be simple, accessible and fool proof—so perfect, in fact, as to be forgotten. You have these attributes in a Bosch Magneto.

There is more vim, vigor and snap in a Bosch Magneto than in any other method of ignition—it's really reliable.

**Be Satisfied      Specify Bosch**

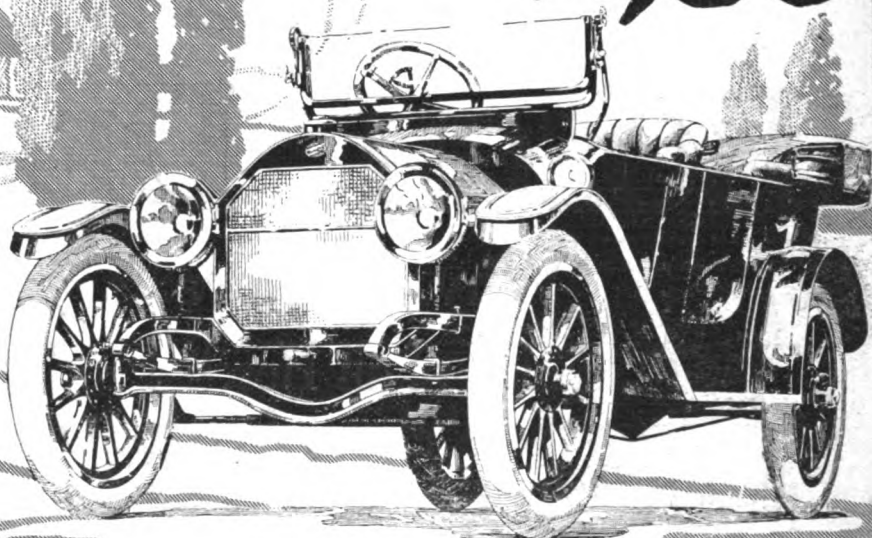
**Bosch Magneto Co., 204 West 46th St., N. Y.**

Motor Parts Company, at Boston and Maine Motor Car Company, at Portland, Distributors for N. E.



# Overland

## \$950



With Gray & Davis Electric Starter and Generator—\$1075, f. o. b. Toledo

**W**E have not merely reduced the price. The 1914 Overland has *more* horsepower, a *longer* wheelbase, *larger* tires, a *roomier* tonneau and electric lights. There is fully 30% greater value all around. The Overland way: Price *down!* Value *up!*

Literature on request. Please address Dept. 52

### The Willys-Overland Company, Toledo, Ohio

35 horsepower  
114-inch wheelbase  
Electric head, side, dash  
and tail lights  
Timken bearings  
New Splitdorf magneto

Model R Schebler carburetor  
Three-quarter floating rear axle  
33x4 inch Q. D. tires  
Cowl dash  
Turkish upholstery  
Genuine, hand buffed leather

Clear-vision windshield  
Mohair top, curtains and boot  
Stewart speedometer  
Electric horn  
Flush U doors with disappearing hinges



# 60 "Six" KISSELKAR 60 "Six"

## The Car of Rare Comfort

With its deeply cushioned commodite seats, 142-inch wheelbase, extra large wheels and tires and big, resilient springs, the powerful, silent, smooth-running KisselKar 60 "Six" typifies solid comfort. Under all road conditions—whether over smooth city streets or country hills—the KisselKar "60" maintains its reputation as the car of rare riding comfort, and easily vindicates its title as the dominant value among the "Big Sixes."

Riding comfort is the biggest thing about any car and is the proof of well balanced construction. The final test of comfort is riding in the car. Yet it is possible to judge of comfort without this test, for the factors are known.

Every inch added to the wheelbase means a steadier riding motion and permits the car to be designed on liberal lines, with roomier tonneau, deeper seats and many comfort features impossible in cars of smaller wheelbase.

The generous KisselKar 60 "Six" wheelbase—142 in.—is the basis of its rare riding comfort. No car can equal the comfort qualities of the KisselKar without matching its liberal design and specifications. A careful comparison will prove that few cars do.

There are three KisselKar models: 60 "Six," \$3150; 48 "Six," \$2350; and 40 "Four," \$1850. All fully equipped; electric started and lighted; left hand drive, center control.

The new KisselKars are now being shown by our representatives at over 300 points. See your nearest Dealer for demonstration, or write us for illustrated catalog.

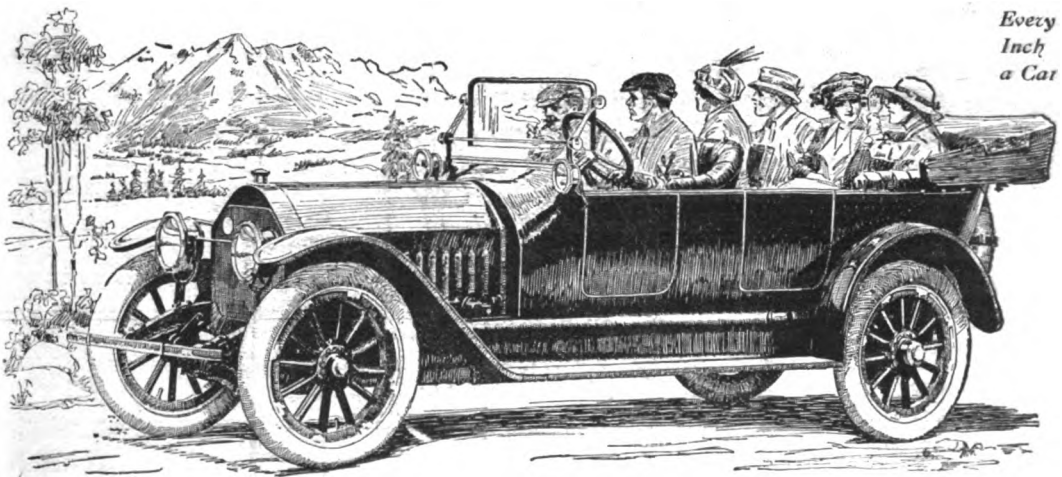
### KISSELKAR SERVICE CONTRACT

KisselKar Service is guaranteed to owners under a written contract that specifies in detail what will be done to lower running cost and retard depreciation. The unusual facilities in the way of factory-trained experts and complete stock of replacements at our Service Stations are always at your disposal.

**KISSELKAR TRUCKS**—Six sizes—1500 lbs. to 6 tons—are used in over 200 distinct lines of business. Write for Truck Catalog.

**KISSEL MOTOR CAR CO., 174 Kissel Ave., HARTFORD, WIS.**

BOSTON, NEW YORK, CHICAGO, MILWAUKEE, KANSAS CITY, MINNEAPOLIS, ST. PAUL, DALLAS, SAN FRANCISCO, LOS ANGELES, OAKLAND, Philadelphia, Detroit, Houston, El Paso, Washington, Baltimore, Nashville, Duluth, Buffalo, Pittsburgh, Hartford, Conn., New Haven, Albany, Troy, Rochester, Providence, Cincinnati, Newark, Montreal, Quebec, Toronto, Winnipeg, Calgary and 300 other principal points throughout America.



Every  
Inch  
a Car

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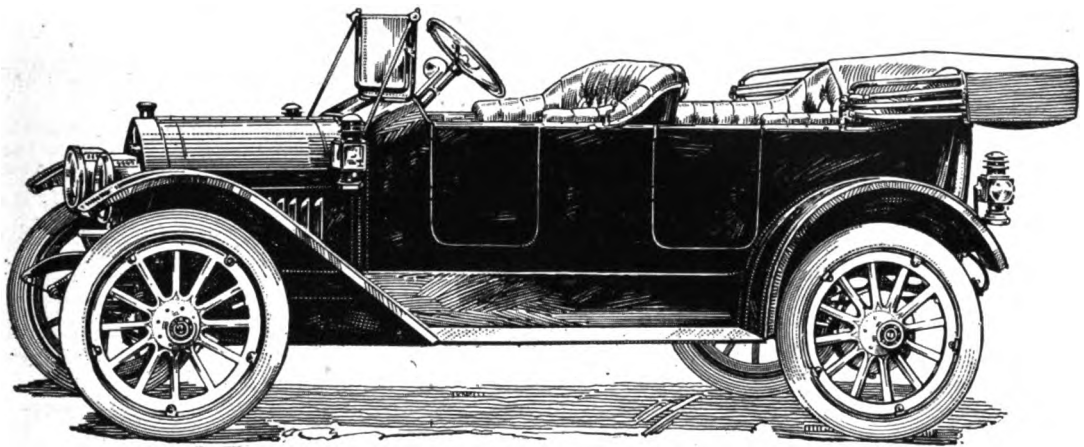
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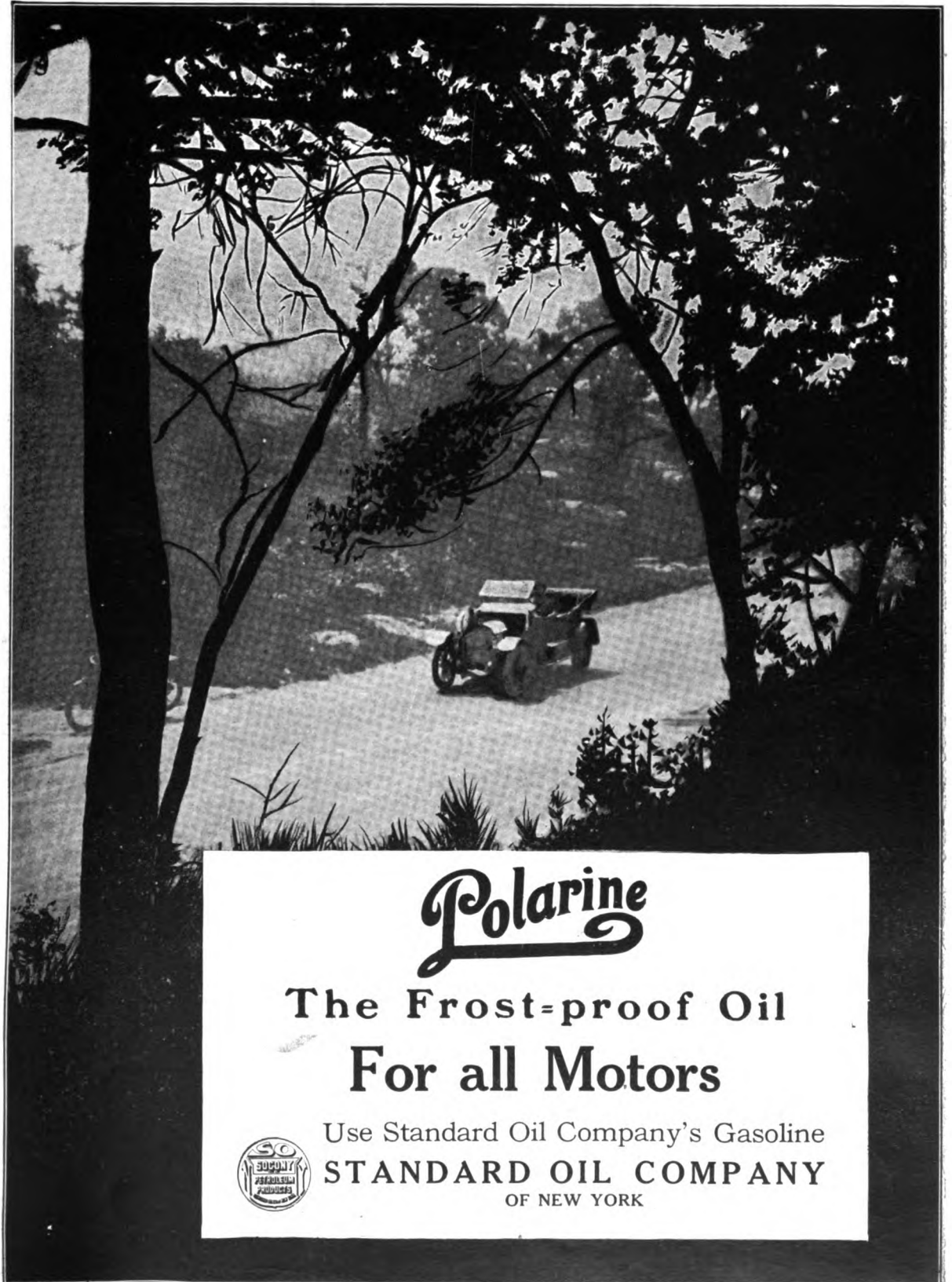
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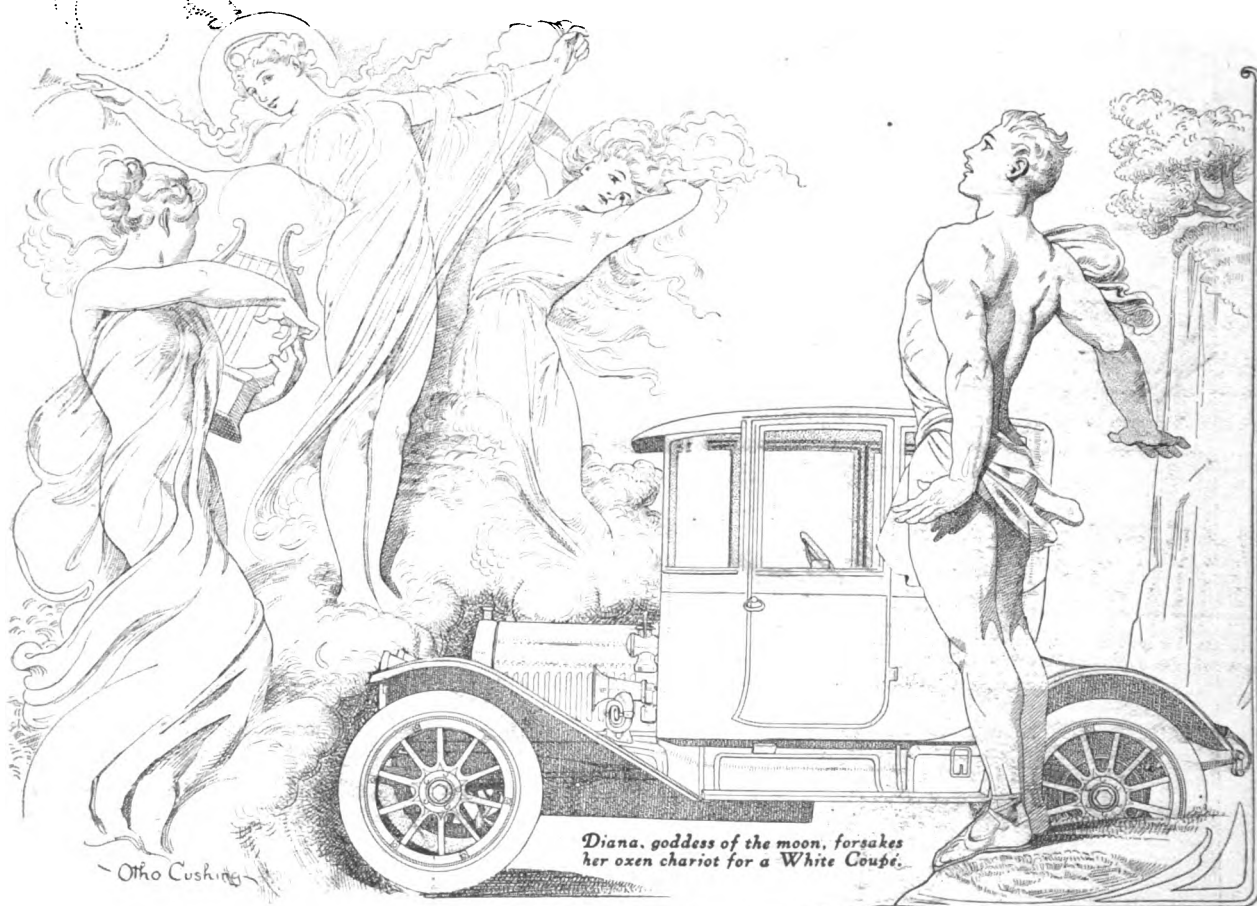
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# THE AUTOMOBILE JOURNAL

VOL. XXXVII, No. 7

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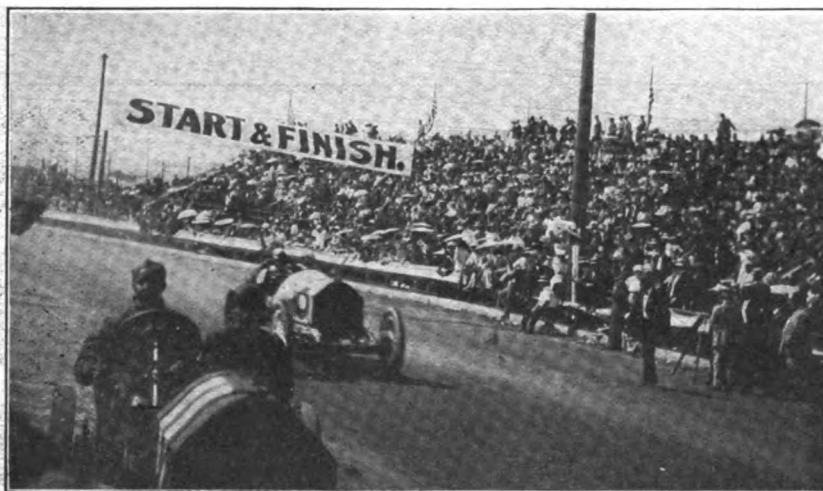
## AMERICAN RACING RESULTS FOR 1913.

**Resume of the Work Done by Cars and Drivers in 33 Important Meets During the Season Just Closed---Road Contests Predominate Among Long Distance Events---Remarkable Record Established by Earl Cooper in a Stutz.**

**A**T NO time in the history of automobile racing has it fallen to the lot of any one man to even approach the record set by Earl Cooper of San Francisco during the racing season just closed. Driving a Stutz car, Cooper has been entered in seven long distance events, in six of which he has returned a winner. Two of these were run simultaneously, so that Cooper has driven the Stutz 1595 miles over the roads of California and Washington, and the Fresno track, in competition with many machines which were higher powered, and has failed to defeat but one car, that being a Benz.

In long distance events of whatever charac-

ter, this term being applied only to those covering a distance of 100 miles or more, the Stutz, made by the Stutz Motor Car Company of Indianapolis, Ind., has returned a winner more times than any other make of machine. Cooper



Earl Cooper and the Stutz, Winning the Santa Monica Road Race—Victorious Combination in Six Out of Seven Long Distance Events Entered.

drove it to victory six times, Gilbert Anderson once and Parsons once; eight times in all. On the face of the returns, so to speak, the Simplex might lay claim to second position in this regard, but it cannot be overlooked in this instance, that the six races credited to Galveston,

Tex., July 27, 28 and 29, really were one race, split up into three sections, each for 100 miles. The three victories won by Fiat cars in long distance events were sep-





Gilbert Anderson and the Victorious Stutz in the Race for the Elgin National Trophy.

arate contests, and give that make of car second place. The results in the long distance races of the year are presented in tabulated form elsewhere.

Thirty-three meets have been reported to The Automobile Journal during the year. In 1912 there were 40. The character of the meets this season was somewhat different from those of past years, and the tabulated list of cars entered either does not include some of the well known victors of other seasons or their names are to be found well toward the bottom. This is explained by the fact that many manufacturers, formerly prominent in the racing field, have ceased to enter cars. This also accounts for a larger percentage of what might be termed hippodrome meets, in which but two or three makes were represented.

Every effort has been made to treat each contestant, whether driver or machine, fairly in this resume. Obviously, it is impractical to set up a standard by which to govern the eligibility of a given meet to be considered in a review of this

nature. Assumedly, the contest board of the American Automobile Association has satisfied itself upon this score before granting a sanction. But, because of the varied nature of the contests, some being for short distances only, others being held on half-mile tracks, and the whole including road, beach, dirt track and specially built speedway events, it does not seem possible to arrive at a definite conclusion which would permit of naming one car or one driver as the champion of the year.

The names of William Endicott, Disbrow, Rickenbacher and Chandler stand at the head of the list of drivers, solely because they have been entered in more races than the others. It can be said, however, that, while these men have competed in some of the most important events of the year, they have gained their victories in a large number of instances while taking part in meets in which there were few entrants. The same thing holds true, in a measure, with respect to the cars. Endicott has driven the Case, Dis-



Ralph DePalma and the Mercer, at the Finish of the Race for the Chicago Automobile Club Trophy.



brow the Simplex and Rickenbacher and Chandler the Mason under these conditions.

The Mercer and Stutz have been warm contenders for premier honors, and generally, both makes have been entered in contests where competition was keen among a large number of entrants. In 1912, Mercer cars, made by the Mercer Automobile Company, Trenton, N. J., were entered 80 times, with 25 firsts, 22 seconds and 18

who support racing with the old time fervor.

Reverting to the matter of long distance events: It may be noted that the number of track events has been increased by two. Last year there was the International Sweepstakes on the Indianapolis speedway, and the 200-mile event at Columbus, O. Joseph Dawson in a National won the former, at an average speed of 78.74 miles an hour, a mark which still stands.

### HOW DRIVERS FINISHED IN 33 IMPORTANT RACE MEETS OF THE SEASON.

|                    | Starts | First | Second | Third |                  | Starts | First | Second | Third |
|--------------------|--------|-------|--------|-------|------------------|--------|-------|--------|-------|
| Endicott, W. ....  | 37     | 4     | 15     | 16    | Gnehm .....      | 2      | 0     | 0      | 1     |
| Disbrow .....      | 33     | 21    | 5      | 5     | Goode .....      | 2      | 0     | 0      | 1     |
| Rickenbacher ..... | 24     | 12    | 7      | 3     | Horan .....      | 2      | 0     | 0      | 1     |
| Chandler .....     | 22     | 12    | 6      | 2     | Hughes .....     | 2      | 0     | 0      | 1     |
| Wishart .....      | 16     | 1     | 11     | 1     | Jeanette .....   | 2      | 0     | 0      | 1     |
| Uibrecht .....     | 15     | 2     | 4      | 9     | Banks .....      | 1      | 1     | 0      | 0     |
| DePalma, R. ....   | 14     | 9     | 0      | 0     | Bell .....       | 1      | 1     | 0      | 0     |
| Mulford .....      | 11     | 3     | 2      | 4     | Benedict .....   | 1      | 1     | 0      | 0     |
| Nikrent, J. ....   | 8      | 1     | 4      | 0     | Briggs .....     | 1      | 1     | 0      | 0     |
| Cooper .....       | 7      | 6     | 1      | 0     | Brown .....      | 1      | 1     | 0      | 0     |
| Burman .....       | 7      | 3     | 2      | 0     | Cailluette ..... | 1      | 1     | 0      | 0     |
| Hearne .....       | 7      | 2     | 2      | 3     | Davis .....      | 1      | 1     | 0      | 0     |
| Morris .....       | 6      | 4     | 0      | 0     | Goux .....       | 1      | 1     | 0      | 0     |
| Newhouse .....     | 6      | 0     | 3      | 3     | Longstreth ..... | 1      | 1     | 0      | 0     |
| Milton .....       | 6      | 0     | 3      | 2     | Moss .....       | 1      | 1     | 0      | 0     |
| LeCain .....       | 6      | 0     | 2      | 4     | Parsons .....    | 1      | 1     | 0      | 0     |
| Nikrent, L. ....   | 6      | 0     | 2      | 2     | Siefert .....    | 1      | 1     | 0      | 0     |
| DePalma, J. ....   | 5      | 5     | 0      | 0     | Sperry .....     | 1      | 1     | 0      | 0     |
| Mason .....        | 5      | 5     | 0      | 0     | Ball .....       | 1      | 0     | 1      | 0     |
| Ferguson .....     | 5      | 2     | 2      | 1     | Cameron .....    | 1      | 0     | 1      | 0     |
| Ralme .....        | 5      | 1     | 1      | 2     | Creger .....     | 1      | 0     | 1      | 0     |
| Verbeck .....      | 5      | 1     | 1      | 2     | Emblem .....     | 1      | 0     | 1      | 0     |
| Tetzlaff .....     | 5      | 1     | 0      | 0     | Hersey .....     | 1      | 0     | 1      | 0     |
| Oldfield .....     | 5      | 0     | 2      | 1     | Jackson .....    | 1      | 0     | 1      | 0     |
| Wetmore .....      | 5      | 0     | 1      | 3     | Joerman .....    | 1      | 0     | 1      | 0     |
| Heineman .....     | 4      | 1     | 3      | 0     | Keagle .....     | 1      | 0     | 1      | 0     |
| Killpatrick .....  | 4      | 1     | 3      | 0     | Kroeger .....    | 1      | 0     | 1      | 0     |
| Moseley .....      | 4      | 1     | 1      | 1     | Madden .....     | 1      | 0     | 1      | 0     |
| Schrunk .....      | 4      | 1     | 0      | 1     | Rader .....      | 1      | 0     | 1      | 0     |
| O'Donnell .....    | 4      | 0     | 1      | 3     | Smith, F. ....   | 1      | 0     | 1      | 0     |
| Carlson .....      | 4      | 0     | 1      | 1     | Smith, W. ....   | 1      | 0     | 1      | 0     |
| Roberts .....      | 3      | 2     | 0      | 1     | Wilds .....      | 1      | 0     | 1      | 0     |
| Wilbur .....       | 3      | 1     | 2      | 0     | Applegate .....  | 1      | 0     | 0      | 1     |
| Menenghetti .....  | 3      | 1     | 1      | 1     | Benet .....      | 1      | 0     | 0      | 1     |
| Hill .....         | 3      | 1     | 0      | 1     | Book .....       | 1      | 0     | 0      | 1     |
| Goetz .....        | 3      | 0     | 3      | 0     | Hanson .....     | 1      | 0     | 0      | 1     |
| Hickman .....      | 3      | 0     | 2      | 1     | Latter .....     | 1      | 0     | 0      | 1     |
| Pullen .....       | 3      | 0     | 1      | 2     | Merz .....       | 1      | 0     | 0      | 1     |
| Caldwell .....     | 3      | 0     | 1      | 1     | Platt .....      | 1      | 0     | 0      | 1     |
| Luttrell .....     | 3      | 0     | 1      | 1     | Pratt .....      | 1      | 0     | 0      | 1     |
| Houpt .....        | 3      | 0     | 0      | 1     | Reeder .....     | 1      | 0     | 0      | 1     |
| Snyder .....       | 2      | 2     | 0      | 0     | Smith, G. ....   | 1      | 0     | 0      | 1     |
| DeWitt .....       | 2      | 1     | 1      | 0     | Tams .....       | 1      | 0     | 0      | 1     |
| Radina .....       | 2      | 1     | 1      | 0     |                  |        |       |        |       |
| Waterman .....     | 2      | 1     | 1      | 0     |                  |        |       |        |       |
| Campbell .....     | 2      | 1     | 0      | 1     |                  |        |       |        |       |
| Anderson .....     | 2      | 1     | 0      | 0     |                  |        |       |        |       |
| Donovan .....      | 2      | 0     | 2      | 0     |                  |        |       |        |       |
| Williams .....     | 2      | 0     | 1      | 1     |                  |        |       |        |       |
| Dawson .....       | 2      | 0     | 1      | 0     |                  |        |       |        |       |
| Lewis .....        | 2      | 0     | 1      | 0     |                  |        |       |        |       |
| Polk .....         | 2      | 0     | 0      | 2     |                  |        |       |        |       |
| Brooker .....      | 2      | 0     | 0      | 1     |                  |        |       |        |       |

thirds. This year, they have made 71 trials, with 21 firsts, 19 seconds and 13 thirds. The average appears to be a trifle better this year, although the total is not so large. Stutz cars were entered 27 times in 1912, with 10 firsts, 10 seconds and seven thirds. This year cars of this make have competed 24 times, with 10 firsts, three seconds and six thirds. These two manufacturers certainly stand at the head of the list of those

Also ran—Bancroft, Bergdoll, Beaudette, Bragg, Briscoe, Buxton, Clark, Crawford, Eldridge, Endicott, H., Evans, Faulkner, Fleming, Fritsch, Grant, Guyott, Hanshue, Henning, Hesch, Hertsch, Hertzel, Jenkins, Kern, Knight, Knipper, Leach, Leybold, Llesaw, Magonne, Mansfield, McConnors, McKelvey, Nichols, Northland, Opshal, Overmeyer, Owen, Pilette, Rhodes, Rice, Schnack, Soules, Stoley, Tobin, Toft, Tower, Trucco, True, Wallace, Waters, Welsh, Willcox, Wilson, Zucarrelli.

Jules Goux's speed this year, in a Peugeot car of French production, was only 75.92. Spencer E. Wishart created new world's class records with a Mercer at Columbus in 1912, but these were exceeded by Ralph Mulford in a Mason in the same event this year. Their respective speeds were 57.49 and 59.16. The additional track events this year were that for 100 miles at Latonia, Ky., in which Rickenbacher drove the Mason at a speed



## TABULATED RESULTS FOR CARS.

|                   | Starts | First | Second | Third |
|-------------------|--------|-------|--------|-------|
| Case .....        | 89     | 16    | 35     | 35    |
| Mason .....       | 73     | 34    | 17     | 14    |
| Mercer .....      | 71     | 21    | 19     | 13    |
| Simplex .....     | 31     | 17    | 4      | 4     |
| Stutz .....       | 24     | 10    | 3      | 6     |
| Bulck .....       | 22     | 3     | 6      | 7     |
| Fiat .....        | 18     | 4     | 5      | 3     |
| Studebaker .....  | 13     | 1     | 5      | 2     |
| National .....    | 8      | 2     | 3      | 1     |
| Chalmers .....    | 7      | 1     | 1      | 3     |
| Peugeot .....     | 6      | 4     | 1      | 0     |
| Benz .....        | 5      | 4     | 0      | 0     |
| Velle .....       | 5      | 1     | 2      | 1     |
| Ohio .....        | 5      | 1     | 1      | 2     |
| *Endicott .....   | 5      | 0     | 3      | 0     |
| Ford .....        | 5      | 0     | 2      | 0     |
| Colby .....       | 5      | 0     | 0      | 1     |
| *Roberts .....    | 4      | 2     | 0      | 1     |
| Mercedes .....    | 4      | 1     | 1      | 0     |
| White .....       | 3      | 1     | 1      | 1     |
| Cino .....        | 3      | 1     | 1      | 0     |
| Moon .....        | 3      | 1     | 0      | 0     |
| Marmon .....      | 3      | 0     | 2      | 0     |
| Maxwell .....     | 3      | 0     | 2      | 0     |
| Keeton .....      | 3      | 0     | 1      | 0     |
| Nyberg .....      | 3      | 0     | 1      | 0     |
| *Tulsa .....      | 3      | 0     | 0      | 1     |
| *Gila .....       | 2      | 1     | 1      | 0     |
| Locomobile .....  | 2      | 1     | 0      | 0     |
| Hudson .....      | 2      | 0     | 0      | 2     |
| *Berlin .....     | 2      | 0     | 0      | 2     |
| Overland .....    | 1      | 1     | 0      | 0     |
| Reo .....         | 1      | 0     | 1      | 0     |
| Inter-State ..... | 1      | 0     | 0      | 1     |
| Lozier .....      | 1      | 0     | 0      | 1     |
| Napier .....      | 1      | 0     | 0      | 1     |
| Schacht .....     | 1      | 0     | 0      | 1     |

Also ran—Alco, \*Anel, Apperson, Cadillac, \*Erwin  
\*Fox, Henderson, Isotta, Macomber, Marion, Mercedes-  
Knight, Pope-Hartford, R-C-H, \*Rovan, Speedwell, Sun-  
beam.

\*Indicates specially built machines—not on the mar-  
ket.

of 58.82, and that for 200 miles at Fresno, Cal.,  
won by Cooper in a Stutz at a speed of 57.69.

Last year there were long distance beach  
races at Galveston, Tex., and Old Orchard, Me.  
No beach event was held this year by which it  
is possible to make comparison. The table shows

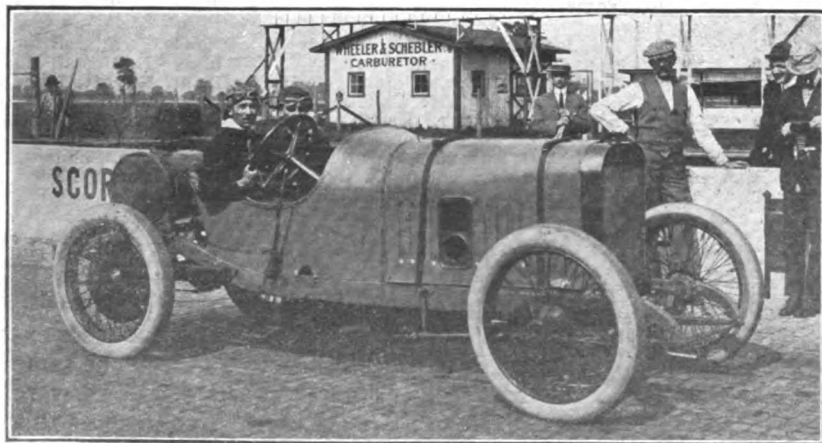
six races. These were in reality but one, and that  
for 300 miles, run in sections, 100 miles each day  
for three consecutive days. The event was again  
subdivided into classes, according to the rules of  
the contest board of the American Automobile  
Association. The tabulation is presented in all  
fairness to both makes of cars and drivers, but  
this explanation is necessary to a proper under-  
standing of the situation.

There were 20 long distance road races last  
year, as follows: Feb. 22, Lake View trophy,  
Bakersfield, Cal.; April 21, Fresno, Cal.; May 4,  
Ferris cup, Jepson cup and Chanslor & Lyon  
trophy, Santa Monica, Cal.; July 5, 301-450  
inches, 231-300 inches and under 231 inches, Ta-  
coma, Wash.; July 6, free-for-all, Tacoma,  
Wash.; Aug. 30, Illinois trophy, Aurora cup and  
Jencks award, Elgin, Ill.; Aug. 31, Elgin National  
trophy, Elgin, Ill.; Oct. 2, Vanderbilt cup, Mil-  
waukee, Wis.; Oct. 3, Wisconsin trophy and  
Pabst Blue Ribbon trophy, Milwaukee, Wis.;  
Oct. 5, Grand Prize, Milwaukee, Wis., and Oct.  
26-28, Los Angeles-Phoenix race.

It will be noted that it is impossible to make  
many comparisons between this list and that pre-  
sented herewith. The better to consider the va-  
rious events, it has been found desirable this  
year, to segregate those road races held over spe-  
cially guarded courses from those which were  
purely cross country in character—something  
which has not been done heretofore. Of the 19  
races of both classes, which have been held dur-  
ing 1913, 14 have been held on the Pacific Coast,  
two in the Southwest, two in the Middle West  
and one in the South. The two chief American  
classics—the Grand Prize and the Vanderbilt cup  
events—have not been held at all.

The Santa Monica race of Aug. 9, may be  
compared with the free-for-all  
over the same course in 1912.  
Last year, Teddy Tetzlaff in a  
Fiat, set a new world's road rac-  
ing record of 78.07 miles an  
hour, which has not yet been ex-  
ceeded. This year, Cooper and  
the Stutz covered 445 miles,  
against Tetzlaff's 303, at a speed  
of 74.26. The highest speed in  
any road race during the year  
was 74.39, made by Cooper and  
the Stutz in the contest for  
heavy cars at Corona, Cal.,  
Sept. 9.

Practically the only event  
run this year which was un-  
der the same conditions as



Julien Goux and the Peugeot Car with Which He Won the International  
Sweepstake Event.



those which governed the same race in 1912, was that for the Elgin National trophy. In 1912 this event was taken by Ralph DePalma in a Mercedes, his average speed being 69 miles an hour. This year the winner was Gilbert Anderson in a Stutz, with speed of 71.28.

The Illinois trophy event of 1912 was under

a speed that averaged 66.46 miles an hour.

The Tacoma races also were held under similar conditions both years. In 1912 the free-for-all for 250 miles was taken by Tetzlaff in a Fiat at a speed of 66.08. In 1913 Cooper and the Stutz finished the same distance for the Montmarathon trophy at a speed of 70.72. There was a 200-mile event for the Potlatch trophy this year, won by

## WINNERS AND PLACE CARS IN YEAR'S LONG DISTANCE RACING EVENTS.

### ROAD RACES, SPECIAL COURSE.

| Heavy Cars, Corona, Cal., Sept. 9.             |        |       |            |
|--|--------|-------|------------|
| Car  | Driver | Miles | Time       |
| Stutz, Cooper                                  | .....  | 251.9 | 3:21:29.20 |
| Marmon, Caldwell                               | .....  | 251.9 | 4:09:33.00 |
| National, Jeanette                             | .....  | *     |            |
| Free-for-All, Corona, Cal., Sept. 9.           |        |       |            |
| Stutz, Cooper                                  | .....  | 300.0 | 4:02:38.00 |
| Fiat, Verbeck                                  | .....  | 300.0 | 4:10:20.00 |
| Fiat, Hill                                     | .....  | *     |            |
| Santa Monica, Cal., Aug. 9.                    |        |       |            |
| Stutz, Cooper                                  | .....  | 445.0 | 6:01:45.00 |
| Mercer, Oldfield                               | .....  | 445.0 | 6:07:45.00 |
| Mercer, Nikrent, L.                            | .....  | 445.0 | 6:28:17.00 |
| Elgin National, Elgin, Ill., Aug. 31.          |        |       |            |
| Stutz, Anderson                                | .....  | 301.0 | 4:13:38.00 |
| Mason, Mulford                                 | .....  | 301.0 | 4:20:31.00 |
| Mercer, Wishart                                | .....  | 301.0 | 4:29:58.00 |
| Owensmouth, Los Angeles, Cal., March 28.       |        |       |            |
| Fiat, Tetzlaff                                 | .....  | 253.2 | 3:34:21.40 |
| Fiat, Oldfield                                 | .....  | 253.2 | 3:46:33.00 |
| Napier, Verbeck                                | .....  | *     |            |
| Potlatch, Tacoma, Wash., July 5.               |        |       |            |
| Stutz, Cooper                                  | .....  | 200.0 | 2:49:32.00 |
| Keeton, Burman                                 | .....  | 200.0 | 3:05:40.00 |
| Inter-State, Latter                            | .....  | 200.0 | 3:10:28.00 |
| Montmarathon, Tacoma, Wash., July 7.           |        |       |            |
| Stutz, Cooper                                  | .....  | 250.0 | 3:32:08.20 |
| Fiat, Lewis                                    | .....  | 250.0 | 3:35:00.00 |
| Tulsa, Hughes                                  | .....  | *     |            |
| Chicago Automobile Club, Elgin, Ill., Aug. 30. |        |       |            |
| Mercer, DePalma                                | .....  | 301.0 | 4:31:56.00 |
| Deltal, Dawson                                 | .....  | 301.0 | 4:39:52.00 |
| Mason, Chandler                                | .....  | *     |            |
| Intercity, Tacoma, Wash., July 6.              |        |       |            |
| Stutz, Parsons                                 | .....  | 102.0 | 1:33:45.80 |
| Stutz, Cameron                                 | .....  | 102.0 | 1:36:36.80 |
| Hudson, Hanson                                 | .....  | 102.0 | 1:51:16.00 |
| Small Cars, Corona, Cal., Sept. 9.             |        |       |            |
| Buick, Waterman                                | .....  | 102.4 | 1:37:26.00 |
| Reo, Jackson                                   | .....  | 102.4 | 1:41:06.40 |
| Studebaker, Goode                              | .....  | 102.4 | 1:46:00.00 |
| Small Cars, Los Angeles, Cal., March 28.       |        |       |            |
| Mercer, Selfert                                | .....  | 200.0 | 3:14:53.40 |
| Maxwell, Joerman                               | .....  | 200.0 | 3:46:30.40 |
| Berlin, Platt                                  | .....  | 200.0 | 4:10:00.00 |
| Free-for-All, San Diego, Cal., March 2.        |        |       |            |
| Benz, Carlson                                  | .....  | 200.0 | 3:23:00.00 |
| Stutz, Cooper                                  | .....  | ↑     |            |
| Buick, Campbell                                | .....  | ↑     |            |
| Point Loma, San Diego, Cal., March 2.          |        |       |            |
| Buick, Campbell                                | .....  | 100.0 | 1:57:00.00 |
| Columbia, S. C., Sept. 1.                      |        |       |            |
| Chalmers, Moss                                 | .....  | 100.0 | 1:59:10.00 |
| San Diego, Cal., Jan. 1.                       |        |       |            |
| Fiat, Hill                                     | .....  | 183.4 | 3:58:12.00 |
| Mercer, Smith, W.                              | .....  | 183.4 | 4:12:12.00 |
| Stutz, Carlson                                 | .....  | 183.4 | 4:16:12.00 |

### TRACK RACES.

| International Sweepstakes, Indianapolis, Ind., May 30. |       |       |            |
|--|-------|-------|------------|
| Peugeot, Goux  | ..... | 500.0 | 6:35:05.00 |
| Mercer, Wishart  | ..... | 500.0 | 6:48:13.00 |
| Stutz, Merz  | ..... | 500.0 | 6:48:49.00 |
| Columbus, O., July 4.                                  |       |       |            |
| Mason, Mulford   | ..... | 200.0 | 3:21:48.00 |
| Nyberg, Madden   | ..... | 200.0 | 3:44:26.65 |
| Mercer, Reeder   | ..... | 200.0 | 3:47:53.00 |
| Latonia, Ky., Sept. 14.                                |       |       |            |
| Mason, Rickenbacher                                    | ..... | 100.0 | 1:42:00.00 |
| Mercer, Luttrell                                       | ..... | ↑     |            |
| Mason, Chandler  | ..... | ↑     |            |
| Fresno, Cal., Feb. 10.                                 |       |       |            |
| Stutz, Cooper  | ..... | 200.0 | 3:28:05.00 |

### BEACH RACES.

| Free-for-All, Galveston, Tex., July 28.    |       |       |            |
|--|-------|-------|------------|
| Peugeot, Ferguson                          | ..... | 100.0 | 1:23:57.30 |
| Simplex, Disbrow                           | ..... | ↑     |            |
| Stutz, LeCain                              | ..... | ↑     |            |
| Free-for-All, Galveston, Tex., July 27.    |       |       |            |
| Simplex, Disbrow                           | ..... | 100.0 | 1:23:59.48 |
| Mason, Chandler                            | ..... | ↑     |            |
| Case, Endicott, W.                         | ..... | ↑     |            |
| Free-for-All, Galveston, Tex., July 27-29. |       |       |            |
| Simplex, Disbrow                           | ..... | 300.0 | 4:17:23.90 |
| Stutz, LeCain                              | ..... | 300.0 | 4:23:25.45 |
| Case, Endicott, W.                         | ..... | 300.0 | 4:48:21.56 |
| Free-for-All, Galveston, Tex., July 29.    |       |       |            |
| Simplex, Disbrow                           | ..... | 100.0 | 1:26:47.31 |
| Stutz, LeCain                              | ..... | ↑     |            |
| Case, Endicott, W.                         | ..... | ↑     |            |
| Class 4C, Galveston, Tex., July 27-29.     |       |       |            |
| Case, Endicott, W.                         | ..... | 300.0 | 4:46:21.56 |
| Class 1C, Galveston, Tex., July 27-29.     |       |       |            |
| Studebaker, Moseley                        | ..... | 200.0 | 5:22:52.85 |

### CROSS COUNTRY ROAD RACES.

| Los Angeles-Sacramento, July 4. |       |       |             |
|---------------------------------|-------|-------|-------------|
| Fiat, Verbeck                   | ..... | 445.3 | 11:01:06.00 |
| Buick, Waterman                 | ..... | 445.3 | 11:21:25.00 |
| Fiat, Oldfield                  | ..... | 445.3 | 11:22:53.00 |
| Albuquerque-Santa Fe, July 4.   |       |       |             |
| Overland, Sperry                | ..... | 130.0 | 4:19:58.60  |
| Buick, Emblem                   | ..... | 130.0 | 5:33:38.60  |
| Vellie, Caldwell                | ..... | 130.0 | 6:03:00.00  |
| Los Angeles-Phoenix, Nov. 2-4.  |       |       |             |
| Locomobile, Davis               | ..... | 564.0 | 18:50:00.00 |
| Marmon, Ball                    | ..... | 564.0 | 21:05:00.00 |
| Buick, Nikrent, L.              | ..... | 564.0 | 22:11:00.00 |

\*Running; †time not reported.

somewhat similar conditions to those which governed the race for the Chicago Automobile Club's cup over the same course this year, although the distance was increased from 203.5 miles to 301. In 1912 this race went to Charles Merz in a Stutz, with speed of 66.15. This year Ralph DePalma in a Mercer won the event at

Cooper in a Stutz at a speed of 70.87. Last year two classes of cars were sent over the course for 150 miles, with Cooper in a Stutz taking one of them at a speed of 66.66 and Pullen in a Mercer the other at a speed of 61.19. Evans in a Flanders (now the Studebaker) won a 100-mile event over the same course last year in 61.05.



## PROVIDENCE SHOW THANKSGIVING WEEK.

**A**RRANGEMENTS are practically completed for the third annual show of the Providence Automobile Dealers' Association, which will be held in the state armory on Cranston street, Thanksgiving week, Nov. 22-29. Inasmuch as this will prove the first opportunity for motorists and prospective owners in the East to inspect the 1914 models, the importance of this event is greatly enhanced this year. Inquiries already have been received from all parts of New England, and it is certain that the attendance will by no means be limited to places within easy access of Providence.

Realizing the importance of the event, Manager P. S. Clark has left nothing to be desired. Additional exhibition space has been provided, and the allotment has been with a view to permitting as many makes as possible to be displayed. Unlike other years, there has been no attempt to limit the exhibitors to members of the association, and as a result a much larger representation of the makers will be had.



P. S. Clark, Manager, Providence Automobile Show.

The show is to be divided into four sections. The main floor will be devoted to the presentation of pleasure cars, while commercial vehicles of all types and motorcycles will be exhibited in the basement. Accessories will be displayed along the side walls in the basement and in the large entrance end of the armory. The list of exhibitors to date follows:

### Pleasure Cars.

**Abbott-Detroit**, Whittten Motor Vehiele Company; **American**, Pugh Bros. Company; **Apperson**, Adams & Knight; **Buick**, Aetna Bottle & Stopper Company; **Cadillac**, Cadillac Auto Company; **Chalmers**, Davis Automobile Company; **Cole**, William H. Fuller; **Detroit**, E. E. Whipple; **Fiat**, Fiat Motor Sales Company; **Franklin**, Wallace L. Wilcox Company; **Herreshoff**, Whittten Motor Vehiele Company; **Hudson**, L. B. Lorimer; **Jackson**, Lister, Smith & Walsh Company; **Jeffery**, Thomas B. Jeffery Company; **King**, King Motor Car Company; **KisselKar**, Nock Auto

Company; **Knox**, Hitchcock-Banks Motor Car Company; **Locomobile**, Davis Automobile Company; **Marion**, Pugh Bros. Company; **Maxwell**, Providence Motor Car Company; **Mercer**, Adams & Knight; **McIntyre**, C. K. Setchell; **Oakland**, P. S. Clark; **Oldsmobile**, E. A. Sontag; **Overland**, Pugh Bros. Company; **Packard**, Packard Motor Car Company; **Paige**, Lister, Smith & Walsh Company; **Palmer-Singer**, Pugh Bros. Company; **Peerless**, Peerless Motor Car Company; **Pierce-Arrow**, Foss-Hughes Company; **Pilot**, Herbert E. Bradford; **Pope-Hartford**, Pope-Hartford Auto Company; **Premier**, John O'Donnell; **Regal**, Davis Automobile Company; **Reo**, William Hughes Company; **Stanley Steam**, Capitol Motor Car Company; **Stevens-Duryea**, J. E. Newton; **Studebaker**, Goodwin-Sherman Motor Car Company; **Stutz**, Kendall garage; **Veile**, Providence Motor Car Company; **White**, White Automobile Company; **Winton**, Davis Automobile Company.

### Commercial Vehicles.

**Federal**, Pugh Bros. Company; **International**, F. B. & A. W. Hopkins; **Kelly**, R. S. Longley; **KisselKar**, Nock Auto Company; **Knox**, Hitchcock-Banks Motor Car Company; **Mala**, U. S. Mill Supply Company; **Packard**, Packard Motor Car Company; **Peerless**, Peerless Motor Car Company; **Pierce-Arrow**, Foss-Hughes Company; **Pope-Hartford**, Pope-Hartford Auto Company; **Stanley Steam**, Stanley Motor Carriage Company; **White**, White Automobile Company; **Willis Utility**, Pugh Bros. Company.

### Motorcycles.

**Excelsior**, Hiram G. Baxter; **Flying Merkel**, Marceau Bros.; **Harley-Davidson**, Elmwood Cyclery; **Henderson**, Hiram G. Baxter; **Indian**, B. A. Swenson; **Yale**, Marceau Bros.

### Accessories.

Elmwood Cyclery, motorcycle sundries; William D. Goff, insurance; B. A. Swenson, general line; Vesta Providence Company, electric outfits, lamps and storage batteries; Waite Auto Supply Company, full line; Wayne Oil Tank & Pump Company, storage systems.

The decorative treatment is expected to exceed anything ever before attempted in the smaller cities. This matter is in the hands of the Koster Company, which concern has for many years taken charge of the decorations for the inaugural ball in Washington, the horse show in New York City, and which had charge of this feature during the historical Hudson-Fulton celebration. The main hall will convey the impression of a Japanese garden, which will have the appearance of being extended by an immense painting in oil on silk at the rear of the room. The other sections of the show will be treated similarly.

A special musical programme has been prepared, in charge of Fay's band, and arrangements are being completed for a particularly pleasing reception for Thanksgiving Eve, which will be known as society night. Governor Pothier, members of the legislature and the city officials have signified their intention of being present.

William R. Wilcox, formerly chairman of the public service commission in New York State, and Dr. L. Clark Seelye, president of Smith College, Northampton, Mass., have been appointed an advisory committee to assist in examining the affairs of the American Locomotive Company.



## BOSTON'S ELECTRIC AUTOMOBILE SALON.

**W**HETHER or not Boston is the Hub of the Universe, it is certain that more innovations in the automobile industry have originated in that

city than in any other centre. The first automobile salesroom in America was opened in Boston. The first exclusive display of horseless carriages in this country was held there. There is a long list of other pioneer events, but the latest innovation is an Electric Automobile Salon.



**Herbert W. Moses, Manager, Boston Electric Automobile Salon.**

The originator of this new plan is the Electric Motor Car Club of Boston, an extremely energetic organization, composed of electric vehicle salesmen, central station men and others interested in electric vehicles of all types. Since its formation in April, 1911, it has co-operated in every way with the New England Section, Electric Vehicle Association of America, in promoting the electric automobile, not only in Boston, but throughout the New England states. The Electric Automobile Salon is but another step in the general scheme of promotive publicity.

Nothing but pleasure cars will be shown. The display will be made by the Boston representatives of the manufacturers, and the latter will co-operate by sending their latest models. The salon will be held in the ball room of the Copley Plaza hotel, Nov. 17-19, being open from 10 in the morning until 11 at night each day. All the details have been arranged so as to be in keeping with the importance of the event, both from a business viewpoint and with respect to its pioneer aspect.

Among the local agencies which will be represented are the following:

S. R. Bailey & Co., 895 Boylston street, Bailey; Frank N. Phelps, 801 Boylston street, Baker; William L. Russell Company, Motor Mart, Buffalo; J. Walter Emery, 131 State street, Church-Field; Imperial Motor Car Company,

182 Columbus avenue, Columbus; Anderson Electric Car Company of Boston, 903 Boylston street, Detroit; D. C. Tiffany Company, 136 Chestnut street, Ohio; Peerless Motor Car Company, 660 Beacon street, Rauch & Lang; W. H. Stevens, 1029 Boylston street, Standard; J. W. Bowman Company, 91 Massachusetts avenue, Waverley; Whitten-Gilmore Company, 620 Commonwealth avenue, Woods;

The salon will be under the management of Herbert W. Moses, who was manager of the Boston electric show a year ago. Electric vehicles of all types were displayed at that event, in conjunction with all kinds of electric appliances, the exhibition taking place in Mechanics' building, where so many of the Boston automobile shows have been held. He will be assisted by the following special committees, consisting of members of the club:

Exhibits—John L. Snow, Albert Weatherby, J. W. Bowman, E. A. Gilmore, D. C. Tiffany.

Reception—Charles J. Hatch, Leavitt L. Edgar, L. R. Vredenburg, Frank B. Carter, Dearborn Bailey, Frank J. Stone.

Advertising—Albert Weatherby, Converse D. Marsh, D. C. Tiffany, L. D. Gibbs.

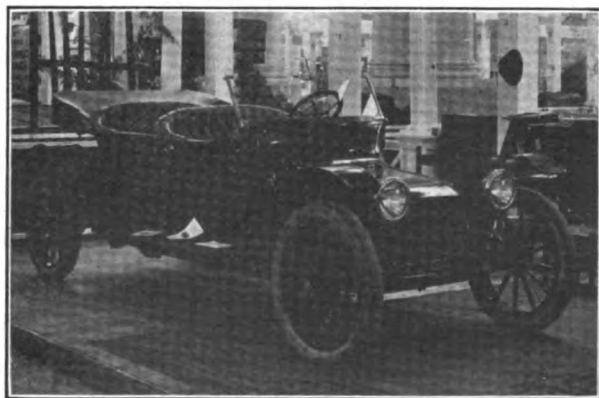
Finance—J. S. Codman, Frank J. Stone, E. S. Mansfield.

Music—J. S. Codman, Day Baker.

Signs—L. R. Walls, Albert Weatherby.

Police and parking—C. S. Smith.

It cannot be made too strong that this is the first time in the history of the automobile industry that it has been deemed expedient to hold a show devoted solely to the exploitation of electric pleasure cars. It may be admitted that the innovation is somewhat pretentious, but it is felt that the section of which Boston is the logical business centre is particularly well adapted to the use of electric vehicles of this type and that the possibilities have not hitherto been brought to the attention of the public in a manner to car-

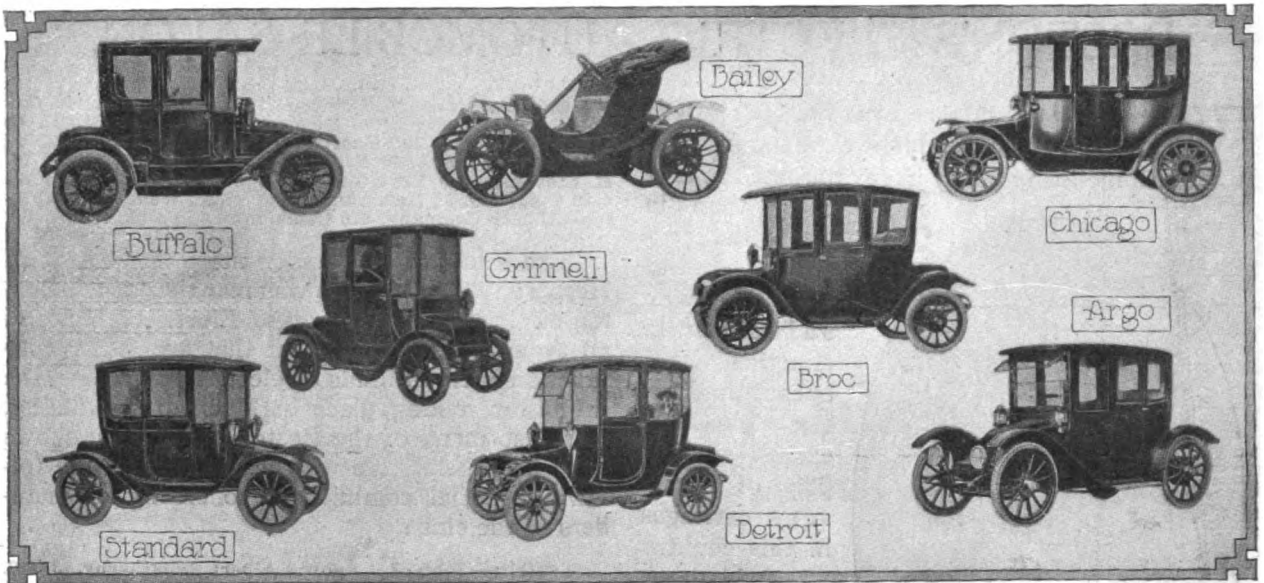


**New Bailey Electric Touring Car, as Revealed at Recent New York Electrical Show.**

ry the conviction that should be realized.

Recent development among electric vehicle and battery manufacturers has been such as to





make direct appeal to the residents of this section. Electric pleasure automobiles have been utilized with splendid success in city and suburban service for some years, but that they present satisfactory means for intercity communication and even long distance touring is a newer phase of the situation which it is the purpose of this exhibition to bring more directly to the attention of the public. That the public is ready to receive and assimilate this information is borne out by the increased sales which have resulted from the co-operative educational campaign conducted by the two organizations already mentioned. There

can be little doubt that special emphasis will be laid upon this feature, and that the first Electric Automobile Salon will mean an increased interest in the electric pleasure car throughout the whole of New England.

Because of this fact manufacturers of this type of automobile will do well to supplement the work inaugurated at this time by energetic effort to have their product suitably represented in this field. The list of makers follows:

Anderson Electric Car Company, Detroit, Mich., Detroit; Argo Electric Vehicle Company, Saginaw, Mich., Argo; S. R. Bailey & Co., Amesbury, Mass., Bailey; Baker Motor Vehicle Company, Cleveland, O., Baker; Borland-

### DETAILED SPECIFICATIONS OF ELECTRIC PLEASURE CARS.

| Make, Model and Type         | Motor   | Battery     | Amp.<br>Hrs. | Mileage | Drive           | Tire<br>Speed Size | Wheel-<br>base | Seat | Price  |
|------------------------------|---------|-------------|--------------|---------|-----------------|--------------------|----------------|------|--------|
| Argo, B, roadster.....       | West.   | Exide, 40   | 138          | 100     | bevel, herring. | 5 36x4             | 108½           | 4    | \$2500 |
| Argo, A, brougham.....       | West.   | Exide, 40   | 138          | 100     | bevel, herring. | 5 36x4             | 108½           | 4    | 2800   |
| Argo, C, limousine.....      | West.   | Exide, 40   | 138          | 80      | bevel, herring. | 5 36x4             | 110            | 5    | 3100   |
| Bailey, F, roadster.....     | G. E.   | Edison, 60  | 187½         | 75-100  | chain           | 6 33x4             | 112            | 2    | 2900   |
| Bailey, phaeton.....         | G. E.   | Edison, 54  | 150          | 60-90   | chain           | 4 32x3½            | 82             | 3    | 2600   |
| Bailey, touring.....         | G. E.   | Edison, 60  | ..           | 90-100  | chain           | 6 .....            | ..             | 4    | 3300   |
| Baker, WA, open.....         | G. E.   | Exide, 34   | 153          | 75-100  | chain           | 6 32x4             | 88             | 2    | 2300   |
| Baker, VAE, coupe.....       | G. E.   | Exide, 34   | 153          | 75-100  | chain           | 6 32x4             | 88             | 4    | 2800   |
| Baker, ZF, brougham.....     | G. E.   | Exide, 42   | 135          | 75-100  | chain           | 6 34x4½            | 92             | 5    | 3100   |
| Borland, 52, roadster.....   | G. E.   | Exide, 42   | 112          | 75-90   | bevel           | 6 34x4             | 96             | 2    | 2550   |
| Borland, 50, coupe.....      | G. E.   | Exide, 40   | 112          | 80-100  | bevel           | 6 34x4             | 96             | 3    | 2900   |
| Borland, 58, coupe.....      | G. E.   | Exide, 40   | 112          | 70      | bevel           | 6 34x4             | 96             | 5    | 2900   |
| Broc, 28, brougham.....      | West.   | Exide, 40   | 135          | 75-95   | bevel, spur     | 5 36x4             | 96             | 5    | 2900   |
| Broc, 29, brougham.....      | West.   | Exide, 40   | 135          | 75-95   | bevel, spur     | 5 36x4             | 96             | 5    | 2950   |
| Broc, 31, brougham.....      | West.   | Exide, 40   | 135          | 75-95   | bevel, spur     | 5 36x4             | 96             | 5    | 2950   |
| Broc, 32, brougham.....      | West.   | Exide, 40   | 135          | 75-95   | bevel, spur     | 5 36x4             | 96             | 5    | 3000   |
| Broc, 33, brougham.....      | West.   | Exide, 40   | 135          | 75-95   | bevel, spur     | 5 36x4             | 96             | 5    | 3100   |
| Broc, 34, brougham.....      | West.   | Exide, 40   | 135          | 75-95   | bevel, spur     | 5 36x4             | 96             | 5    | 3100   |
| Broc, 35, brougham.....      | West.   | Exide, 40   | 135          | 75-95   | bevel, spur     | 5 36x4             | 96             | 5    | 3150   |
| Broc, 36, brougham.....      | West.   | Exide, 40   | 135          | 75-95   | bevel, spur     | 5 36x4             | 96             | 5    | 3200   |
| Buffalo, 29, roadster.....   | Diehl   | Phlla., 42  | 140          | 66      | bevel           | 5 34x4½            | 100            | 2    | 2600   |
| Buffalo, 30, coupe.....      | Diehl   | Phlla., 42  | 140          | 60      | bevel           | 5 34x4½            | 100            | 5    | 2900   |
| Buffalo, 30B, coupe.....     | Diehl   | Phlla., 42  | 140          | 58      | bevel           | 5 34x4½            | 100            | 5    | 3000   |
| Century, SB, closed.....     | West.   | option, 30  | 165          | 75      | bevel           | 6 36x4             | 96             | 4    | 2850   |
| Century, LB, closed.....     | G. E.   | option, 42  | 140          | 90      | bevel, worm     | 4 36x4½            | 104            | 5    | 3250   |
| Chicago, 131, coupe.....     | West.   | Exide, 40   | 140          | 75-100  | bevel           | 5 36x4             | 96             | 5    | 3000   |
| Chicago, 141, coupe.....     | West.   | Exide, 40   | 140          | 75-100  | bevel           | 5 36x4             | 96             | 5    | 3000   |
| Chicago, 142, limousine..... | West.   | Exide, 40   | 140          | 75-100  | bevel           | 5 36x4             | 104            | 5    | 3300   |
| Detroit, 44, victoria.....   | Detroit | Detroit, 40 | ..           | 50-85   | bevel           | 5 36x4             | 85             | 4    | 2300   |



## DETAILED SPECIFICATIONS OF ELECTRIC PLEASURE CARS (Continued).

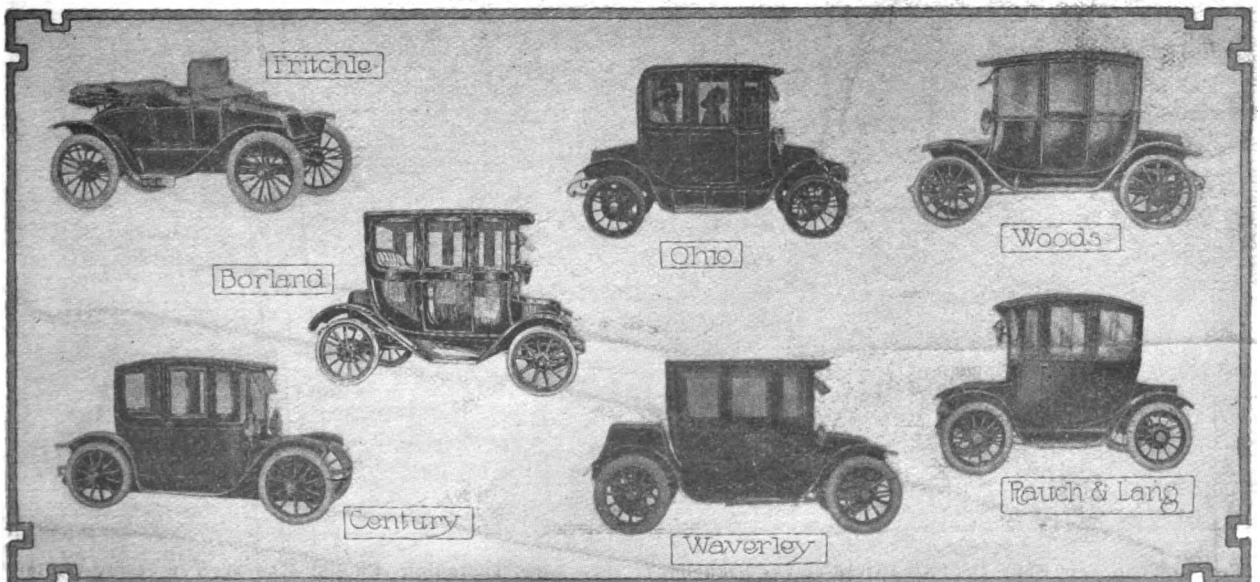
| Make, Model and Type                 | Motor    | Battery      | Amp.<br>Hrs. | Mileage | Drive           | Speed | Tire<br>Size | Wheel-<br>base | Seat | Price |
|--------------------------------------|----------|--------------|--------------|---------|-----------------|-------|--------------|----------------|------|-------|
| Detroit, 46, roadster.....           | Detroit  | Detroit, 40  | ...          | 50-85   | worm            | 5     | 36x4 1/2     | 100            | 2    | 2500  |
| Detroit, 43, brougham.....           | Detroit  | Detroit, 40  | ...          | 50-85   | bevel           | 5     | 36x4         | 94             | 4    | 2550  |
| Detroit, 45, brougham.....           | Detroit  | Detroit, 40  | ...          | 50-85   | bevel           | 5     | 36x4         | 98             | 5    | 2800  |
| Detroit, 47, brougham.....           | Detroit  | Detroit, 40  | ...          | 50-85   | worm            | 5     | 36x4 1/2     | 100            | 4    | 2850  |
| Detroit, 48, brougham.....           | Detroit  | Detroit, 40  | ...          | 50-85   | worm            | 5     | 36x4 1/2     | 100            | 5    | 3000  |
| Fritchle, brougham.....              | Fritchle | option, 32   | ...          | 70-90   | worm            | 5     | 34x4         | 104            | 5    | 3600  |
| Fritchle, coupe.....                 | Fritchle | option, 32   | ...          | 80-100  | worm            | 5     | 34x4         | 88             | 5    | 3000  |
| Fritchle, coupe.....                 | Fritchle | option, 32   | ...          | 80-100  | worm            | 5     | 34x4         | 96             | 4    | 3000  |
| Fritchle, roadster.....              | Fritchle | option, 32   | ...          | 100     | worm            | 5     | 34x3 1/2     | 96             | 3    | 2400  |
| Fritchle, touring.....               | Fritchle | option, 32   | ...          | 70-100  | worm            | 5     | 34x4         | 104            | 5    | 2500  |
| Grinnell, K, brougham.....           | West.    | U. S. L., 30 | 175          | 65      | bevel           | 5     | 34x4         | 94             | 4    | 2950  |
| Grinnell, R, brougham.....           | Grinnell | U. S. L., 40 | 175          | 80      | bevel           | 5     | 34x4 1/2     | 105            | 5    | 3400  |
| Grinnell, S, brougham.....           | Grinnell | U. S. L., 40 | 158          | 75      | bevel           | 5     | 34x4 1/2     | 100            | 5    | ....  |
| Ohio, O, brougham.....               | G. E.    | Exide, 40    | 160          | 75-125  | bevel           | 5     | 34x4 1/2     | 98 1/2         | 5    | 2900  |
| Ohio, M, brougham.....               | G. E.    | Exide, 40    | 160          | 75-125  | bevel           | 5     | 34x4 1/2     | 98 1/2         | 5    | 3200  |
| Ohio, Y, brougham.....               | G. E.    | Exide, 40    | 160          | 75-125  | bevel           | 5     | 34x4 1/2     | 98 1/2         | 5    | 3500  |
| Rauch & Lang, R, roadster.....       | Hertner  | option, 42   | 153          | 50-100  | worm            | 6     | 32x4         | 92             | 3    | 2600  |
| Rauch & Lang, CR, roadster.....      | Hertner  | option, 42   | 153          | 50-100  | worm            | 6     | 32x4         | 92             | 3    | 2800  |
| Rauch & Lang, DB, demi-brougham..... | Hertner  | Exide, 42    | ...          | 50-100  | worm            | 6     | 32x4         | 86             | 4    | 2800  |
| Rauch & Lang, B4, brougham.....      | Hertner  | option, 41   | 153          | 60-100  | worm            | 6     | 33x4 1/2     | 92             | 4    | 2950  |
| Rauch & Lang, J4, coach.....         | Hertner  | Exide, 42    | 153          | 60-100  | worm            | 6     | 33x4 1/2     | 96             | 5    | 3100  |
| Rauch & Lang, TC, town car.....      | Hertner  | Exide, 41    | 153          | 50-80   | chain           | 6     | 33x4 1/2     | 105            | 7    | 3800  |
| Standard, M, coupe.....              | West.    | Exide, 30    | 140          | 60-80   | bevel           | 6     | 33x4         | 96             | 4    | 1990  |
| Tiffany, M-2, coupe.....             | Wagner   | LBA, 30      | 135          | 75      | worm            | 6     | 33x4         | 100            | 4    | 2500  |
| Waverley, 105, brougham.....         | Wav'ley  | option, 42   | 162          | 75      | direct          | 4     | 34x4         | 106            | 4    | 2800  |
| Waverley, 104, brougham.....         | Wav'ley  | option, 42   | 162          | 75      | direct          | 4     | 34x4         | 106            | 4    | 2900  |
| Waverley, 107, brougham.....         | Wav'ley  | option, 42   | 162          | 75      | direct          | 4     | 34x4         | 106            | 4    | 3150  |
| Waverley, 102, limousine.....        | Wav'ley  | option, 42   | 162          | 75      | double herring. | 4     | 34x4         | 109            | 5    | 3500  |

Abbreviations—West., Westinghouse; G. E., General Electric; Wav'ley, Waverley; herring., herringbone.

Grannis Company, Chicago; Borland; Broc Electric Vehicle Company, Cleveland, O.; Broc; Buffalo Electric Vehicle Company, Buffalo, N. Y.; Buffalo; Century Electric Motor Car Company, Century; Chicago Electric Motor Car Company, Chicago, Chicago; Church-Field Company, Sibley, Mich.; Church-Field; Clark Motor Car Company, Buffalo, N. Y.; Clark; Colonial Electric Car Company, Detroit, Colonial; Columbus Buggy Company, Columbus, O.; Columbus; Dayton Electric Car Company, Dayton, O.; Dayton; Fritchle Automobile & Battery Company, Denver, Col.; Fritchle; Grinnell Electric Car Company, Detroit, Grinnell; Ideal Electric Company, Chicago, Ideal; C. P. Kimball Company, Chicago, Kimball; Ohio Electric Car Company, Toledo, O.; Ohio; Phipps Electric Company, Detroit, Phipps; Rauch & Lang Carriage Company, Cleveland, O.; Rauch & Lang; Standard Electric Car Company, Jackson, Mich.; Standard; Storage Battery Power Company, Chicago, Electra; Studebaker Corporation, South Bend, Ind.; Studebaker; Tiffany Electric Company, Pon-

tiac, Mich., Tiffany; Ward Motor Vehicle Company, New York City, Ward; Waverley Company, Indianapolis, Ind., Waverley; Woods Motor Vehicle Company, Chicago, Woods.

The main details of such electric pleasure automobiles as have been made public for the 1914 season are presented in tabulated form herewith. Special attention is drawn to the new Bailey touring car, which was revealed for the first time at the recent New York electrical show, although it does not depart greatly from the standard Bailey design as exemplified in the well known roadster, except in outward appearance.





## STUDEBAKER HAS AN ATTRACTIVE LINE.

FOR the season of 1914 the Studebaker Corporation, Detroit, will produce two chassis, a four and a six, to which will be fitted three body styles, touring, landau-roadster and sedan. The four-cylinder, which is practically a new design, will be equipped with a five-passenger touring body and a two-passenger landau-roadster. A seven-passenger touring, landau-roadster and sedan will be fitted to the six-cylinder chassis.

Both motors have the same bore and stroke, 3.5 by five inches, the cylinder dimensions being the same as the model 25 and the six of 1913. With the exception of more liberal proportions, due to its greater capacity and extra cylinders, the six is similar to the four in design and details.

### Left Hand Drive.

There are several changes in detail, the most pronounced being the adoption of left hand drive with centre control. The importance of this change, in the case of a manufacturer which is said to have sold more than 120,000 cars of the right control and steering type, is especially noteworthy as an indication of the popular demand. The fuel tank is now placed under the cowl, pro-

viding a short and nearly vertical feed to the carburetor, also permitting the front seats to be made lower than with the tank located in the conventional manner.

### DETAILS OF THE NEW STUDEBAKERS.

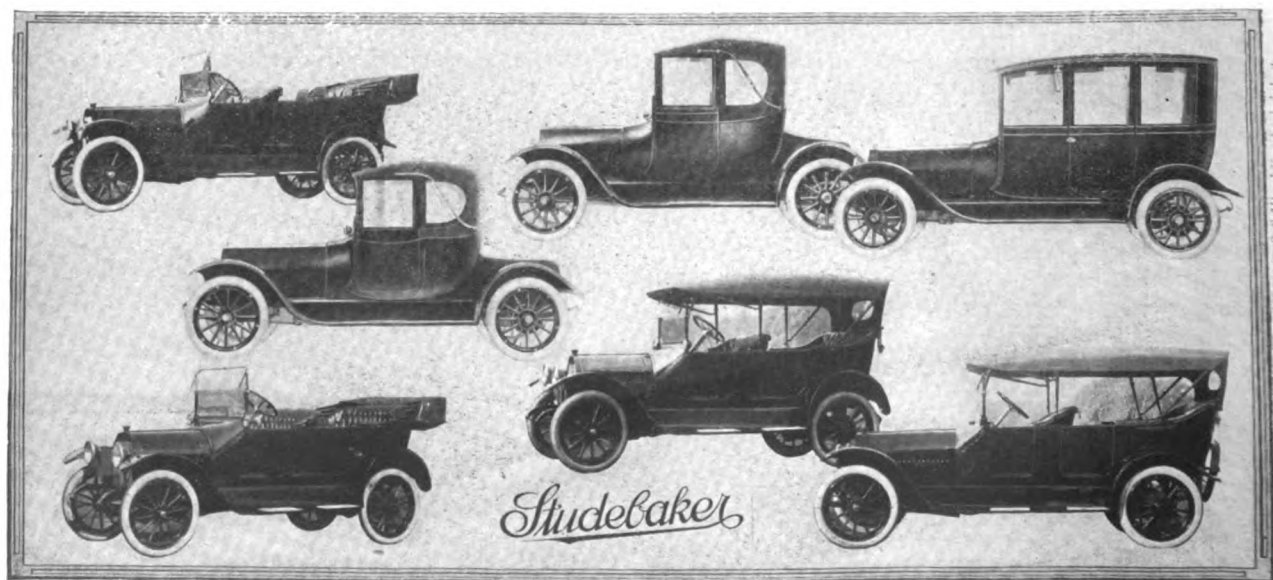
**Fuel Tank Under Cowl.**  
**Larger Steering Wheels.**  
**Full Floating Rear Axle.**  
**Disappearing Auxiliary Seats.**  
**Two-Unit Electrical Equipment.**  
**Left Hand Drive and Centre Control.**  
**Underslung Elliptic Rear Springs on Four.**  
**Bore and Stroke of Both Motors 3½x5 Inches.**  
**Two Chassis Types, a Four and a Six-Cylinder.**  
**Tapering Hoods, Steamline Bodies, Full U Doors.**  
**Three Body Styles, Touring, Landau-Roadster and Sedan.**  
**Improved Transmission, New Clutch Transmission Ring Lubrication.**  
**Ignition from Storage Battery Through Coil and Shaft Driven Remy Distributor.**

A two-unit electrical system replaces the single member, which was driven by silent chain from the drive shaft. The generator is placed on the left of the motor and drives noiselessly by a shaft and pinion in mesh with the camshaft gear. The starting motor is placed on the right, and is connected to the drive shaft by a roller clutch chain and sprockets. A simple pinion

gear reduction encased within the unit, together with the chain sprockets, results in a gear ratio of about 20:1.

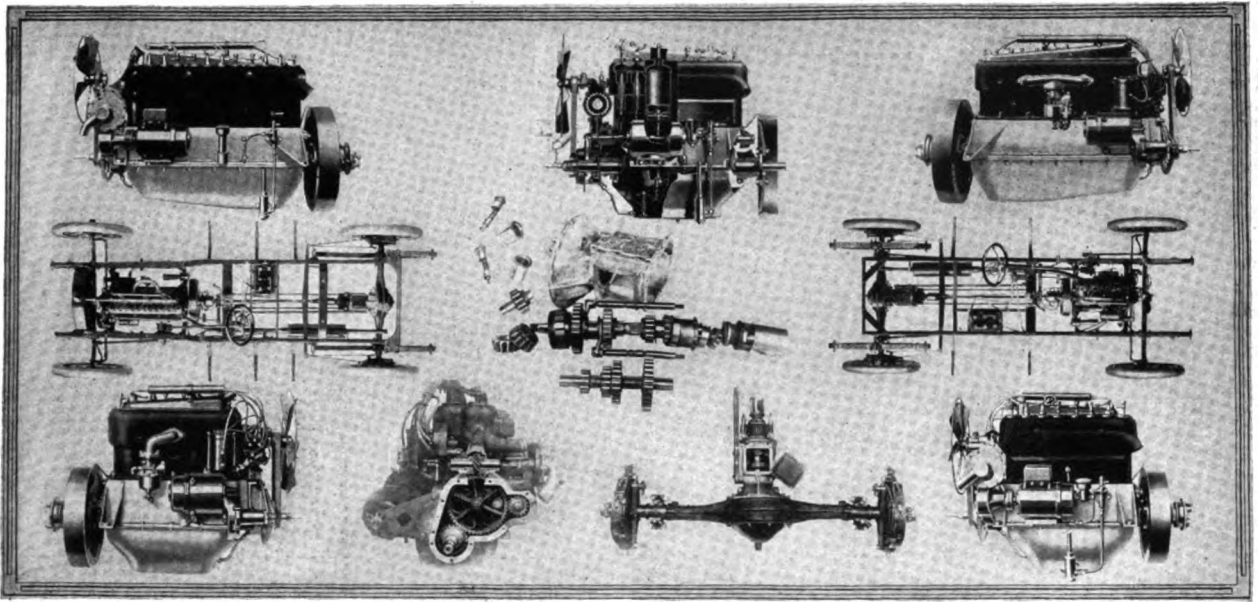
Current is supplied by a six-volt LBA battery. All wiring is enclosed in flexible steel cables. The starter is engaged through a plunger under the heel of the driver and an indicator on the dash shows the direction of current flow. The battery charges readily when the motor is revolving at a speed equal to about 10 miles an hour on the high gear and the charging current attains its maximum at 20 miles an hour.

One great advantage claimed in the system is



Some of the New Body Designs Fitted to the Studebaker 1914 Line, Including Landau-Roadster, a Convertible Type of Attractive Lines.





Illustrating Some of the Refined Mechanical Details of the New Studebaker Line, Comprising a Four and a Six-Cylinder Chassis.

its absolute silence, it being stated that there are no clashing of gears and even the hum of a chain is missing, as the electric motor and its connection become stationary upon the completion of the cranking operation.

#### System Used for Ignition.

The efficiency of the system has resulted in use being made of the current from the battery for ignition purposes, the electricity passing through a coil located at front under the hood and being timed by a Remy distributor, driven by a cross shaft opposite the pump.

The cylinders are cast en bloc. Instead of turning on the cast iron bearings of the piston bosses, the wristpins now turn on bronze bushings, making possible adjustment and replacement without renewal of the piston. The pistons themselves are flat topped, instead of crowned as in 1913; are much lighter, and are equipped with three rings, factory tests having proven that this number is ample for conservation of compression, while the change at the same time is said to reduce the friction within the cylinder fully 25 per cent.

#### Specially Designed Carburetor.

A Schebler carburetor, similar to the new model R, but changed somewhat for Studebaker requirements, is standard equipment. The location of the fuel tank permits mounting the carburetor well up alongside the motor, where warm air facilitates carburetion. The intake manifold is, consequently, much shorter than formerly. It bolts to the block casting, and the design should

make for easy starting in cold weather. Wide range of adjustment is permitted from the dash.

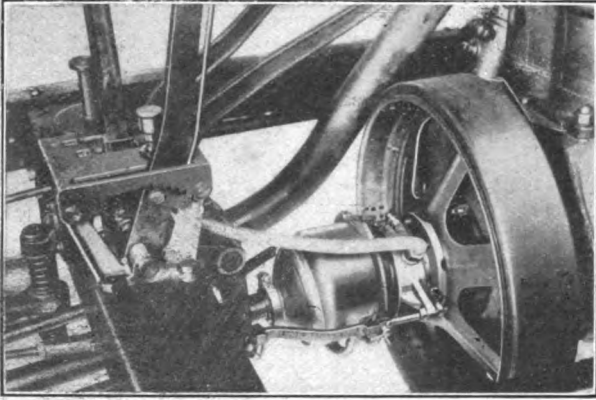
In the details of chassis design are noted many instances toward increased efficiency, and consistent with the policy of the company to produce a car providing maximum service with a minimum of upkeep expense. The clutch is improved in many ways and is larger in both models. Instead of a bearing on a shoulder, it now moves by engagement of two grooves and rings. Lubrication is supplied from a grease cup on the H plate, communicating with the bearing by means of a flexible steel tube.

#### Roller Bearings.

The effort toward increased efficiency is also noted in a liberal use of Timken roller bearings which, in several cases, have replaced those of other types. There are two of these bearings in each front hub, and one has been added to each side of the differential, making possible the adjustment of the ring gear and pinion to a degree of accuracy. A large Hyatt bearing has replaced the plain bronze member formerly used between the forward main driving shaft and the pinion shaft in the transmission.

Large steering wheels, 17 inches on the four and 18 on the six, are new features. The centralizing of the control levers also simplifies to a marked degree the details of the brake and gear shifting mechanism. In accordance with this change, making entrance and egress equally easy from either side, the Studebaker engineers have left both running boards entirely free of equip-





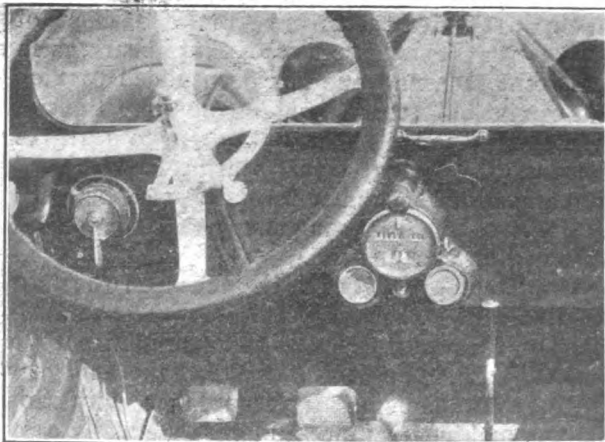
**Clutch and New Clutch Transom Lubrication System Employed on New Studebaker Chassis.**

ment, providing a rack for an extra rim at the rear and placing the battery box under the front seat. The clean design of the running boards in both cars is emphasized by the use of aluminum treads at the entrance of the doors, which are of the full U type.

#### **Features of the Six.**

The six retains many of the prominent characteristics of the former Studebaker six-cylinder car, the wheelbase remaining at 121 inches. Crowned fenders are again a feature, and the transmission system has been altered merely by the addition of several details tending to reduce friction and facilitate adjustment. The body has, however, been widened at the rear and the auxiliary tonneau seats are of the disappearing type, folding into a recess in the back of the front seat, instead of pivoting.

Although the four is a new car, it is typical of Studebaker design; has a wheelbase of 108 inches, two-unit electrical system, full floating rear axle, a change from the semi-floating type;



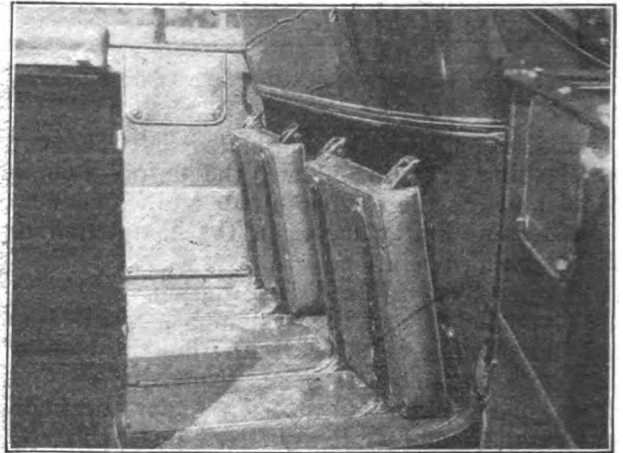
**The Ingenious Grouping of Speedometer, Sight Feed Lubricator and Electric Tell Tale.**

32-inch wheels and en bloc motor. There is a noticeable change in suspension, the full elliptic rear springs being attached to the lower side of the axle housing, an arrangement making possible a great deal of additional dip and permitting of the use of a far more flexible spring than is possible with the conventional equipment.

The dash features are ingenious and original in the grouping of its equipment. In the centre and mounted well up, is a bracket on which are compactly assembled the large figure Stewart speedometer, electric indicator dial and sight feed of the lubricating system. The dash lamp, attached to the top of the bracket, illuminates all.

#### **The Landau-Roadster.**

In addition to the touring bodies with which the chassis will be equipped in standard form, both the four and the six will be marketed with



**The Auxiliary Seats of the Six Are of the Disappearing Type, Folding into a Recess Back of the Front Seat.**

a convertible design, termed the landau-roadster. This body is a copy of the famous design by Salmon & Sons, a well known English body builder. With top and windows lowered, the car is a handsome roadster of the conventional type. In cold or inclement weather, however, the top can be raised and windows slipped into place, and with a few minor adjustments, readily converted into a coupe. The tapering hoods and streamline design make a very attractive appearance. The six landau-roadster is of full three-passenger capacity and is handsomely finished both inside and out. The four design is identical, with the exception of being slightly smaller. The six chassis will be furnished in limited quantities with a sedan body.

The equipment is very complete and the accessories high grade. Goodrich tires on Booth quick detachable demountable rims are standard.



## FEATURES REVEALED AT PARIS SALON.

**A**MERICAN influence was decidedly manifest at the 14th Automobile Salon in the Grand Palais, Paris, France, last month, if one may be permitted to base decision upon the reports which have reached this country. It is more or less well known that French manufacturers paid a visit to the United States something like a year ago for the express purpose of studying American production methods. Since that time, and during the last few months especially, there has been announcement by several makers in that country that they were prepared to offer the public cars built along lines heretofore laid down by American manufacturers.

Very possibly, were all the conditions to be analyzed thoroughly, other reasons might be advanced for the present trend. In many instances it will be found that French makers are offering light weight cars of the type which would be termed run-about in America. These are fitted with small motors

and it is explained by French engineers that they really are a connecting link between the cyclecar and the touring model and that the service rendered by the cyclecar is in a large measure responsible for their existence. Naturally, the cyclecar played an important part in the exhibition.

If the recent Paris Salon may be taken as a criterion, the prevailing practise of American manufacturers to fit some form of electric lighting equipment has had its effect upon foreign producers. The methods of sale in vogue in Great Britain and Continental Europe, under which the chassis is sold separately, to be fitted with such body and accessory equipment as the purchaser may desire, these being supplied by other firms, is considered as having been responsible for the lack of attention previously displayed

along this line. However, practically all of the leading makes, no matter what the country of origin, shown this year, were provided with means for the installation of a lighting dynamo, and no less than 70 different makes of dynamos were to be seen, either on the cars and chassis displayed or at the accessory stands.

As yet, very few foreign makers have decided definitely with respect to the motor starter. That the demand for this added convenience is growing abroad, is evidenced by the fact that several designers are known to be working upon devices of this sort. But, it is perhaps significant, that practically the only self-starting cars displayed

were those of American manufacture. This is a condition which it is expected will be remedied somewhat before the opening of the Olympia show in London, England, this month, since several concerns in Great Britain already have announced the production of motor starters.

There were about 1000 separate exhibitors.

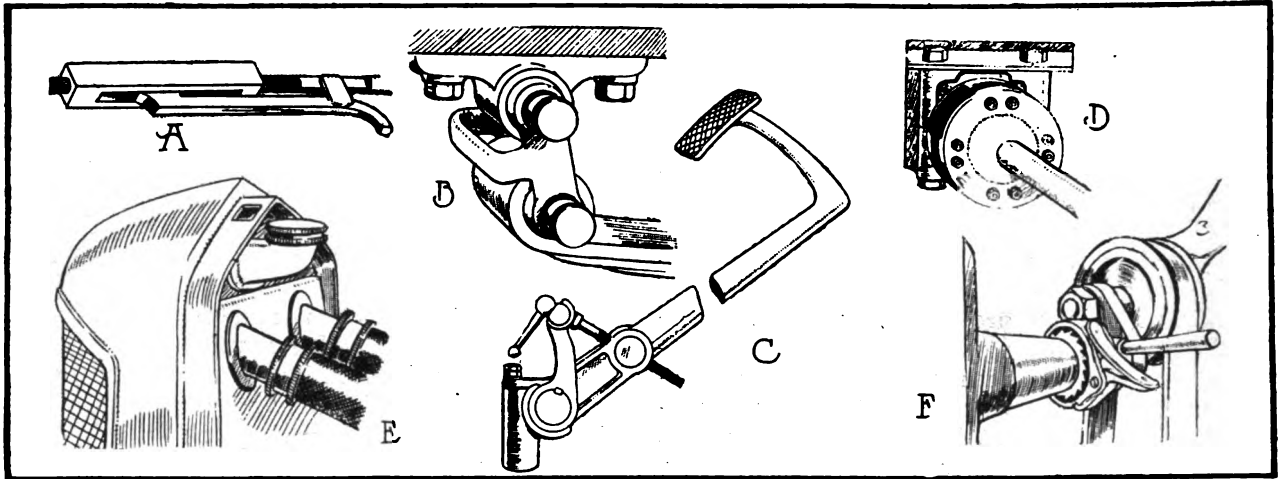
One hundred and thirty-two different makes of cars were displayed. America does not appear to have been very strongly represented in this section, although there were nine makes, as follows: Hudson, Cadillac, Ford, Studebaker, Packard, Hupmobile, Buick, Mitchell and K-R-I-T. The importance of body making as a separate branch of the industry abroad is evidenced by the fact that 64 different manufacturers of bodies exclusively, exhibited 127 different designs, these being entirely apart from the body work displayed on the stands of chassis makers.

Six-cylinder motors were somewhat hard to find. The Delaunay-Belleville is practically the only make which has increased the number of such models, and several Continental manufac-



General View of the Grand Palais, Paris, France, During 14th Automobile Salon.





Some Interesting Mechanical Features Revealed at the Paris Salon: A, Hotchkiss Turnbuckle for Brake Adjustment; B, Shackle at Rear End of Schneider Front Springs; C, Schneider Pedal Adjustment; D, Flexible Joint on Palain Propeller Shaft; E, Filler Member and Twin Water Inlet Pipes on Hispano-Suiza; F, Ratchet Adjustment of Fan Belt on Piccard-Pictet.

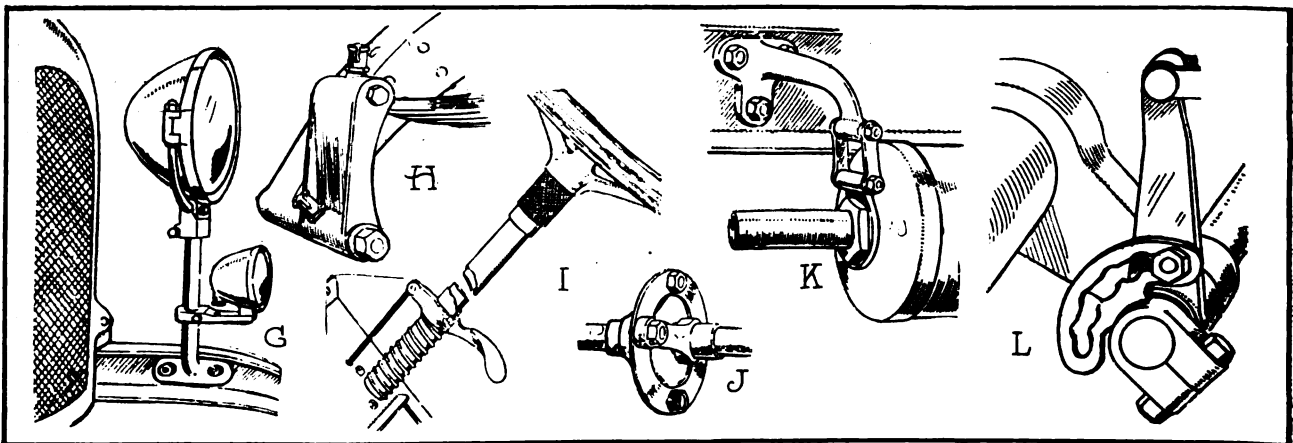
turers have abandoned them entirely. The Rolls-Royce, an English car, displayed but one six, and for the most part this portion of the exhibition was left to America. Leaving out of consideration the British and American cars, but 12 manufacturers showed models of this type. Practically all of the Continental producers are featuring the four.

In the matter of ignition, high-tension magnetos were found on every European car shown. With high efficiency motors the tendency is to fire two sets of plugs simultaneously. In place of the fixed spark, which was decidedly prominent among the cheaper cars a year ago, the automatic advance seems to be gaining advocates very rapidly.

Block motors are still the rule, and there is

abundant evidence of a desire to make the exterior of the casting as free from fittings as possible. Perhaps the most prominent tendency in motor design is toward the long stroke and an increase in the volumetric capacity of the cylinder through the use of hemispherical combustion chambers, etc. The object is to secure greater power and less weight, and to this end some manufacturers are utilizing aluminum pistons and the number of those employing pressed steel for this purpose is growing rapidly.

Accompanying sketches present some of the newer mechanical features revealed on a number of foreign cars, but space does not permit of an extensive description of each. With the aid of the captions a little study should enable the reader to understand the various details.



Additional Mechanical Features Seen at the Paris Automobile Salon: G, Head and Side Lamps on Same Bracket on Palain; H, Vauxhall Rear Spring Shackle; I, Throttle Pedal Arrangement on Licorne; J, Charron Ring Joint Between Clutch and Gearbox; K, Compensating Bracket and Shackle at Rear End of Lion Bollee Muffler; L, Delage Brake Lever Adjustment.



**KEETON TEST TRIP ENDED.****Successful Conclusion of 2500-Mile Journey  
Made by Three 1914 Models.**

The party in charge of the three 1914 models of the Keeton car, made by the Keeton Motor Company, Detroit, which left the factory early in October, returned to Detroit, Oct. 27, after completing a test trip of 2500 miles in hard rains and over bad roads at an average speed of 18 miles an hour. Those who made the journey were: H. H. Newsom, vice president and general manager; Charles Drum, factory manager; Ralph Brown, chief engineer; C. E. Cox, factory superintendent; J. Wallabach, foreman, and Charles Piquette, chief of the electrical department.

Starting from Detroit the itinerary was to Cincinnati, thence to Louisville, Nashville, Atlanta, Augusta, Columbia, Raleigh, Richmond, Staunton, Chambersburg, Pittsburg and Cleveland. The exact mileage covered was 2559 miles, and with the exception of stopping for four days at some of the important cities on the route, the party was driving continuously for three weeks. All conditions of roads were encountered, and from Richmond to Staunton they were almost impassable, while from Pittsburg to Cleveland heavy rainfalls added to the hardships and discomforts of the party. Despite the unfavorable conditions the three cars travelled in a very satisfactory manner, the only trouble being a few side slips into ditches off the roads. At no time on the trip were the cars carried along by other than their own power.

**JONES SPEEDOMETER COMBINE.****Distribution Will Be in the Hands of the H. W.  
Johns-Manville Company.**

The Jones Speedometer Company, New York City, maker of the Jones speedometer, has placed the control of the distribution of its product in the hands of the H. W. Johns-Manville Company of that city. Within the next few months, completely equipped service stations will be established by the latter concern in all localities essential to give owners of Jones instruments speedy service and adjustments close at home.

The speedometer will continue to be manufactured under the personal supervision of the inventor, Joseph W. Jones, but will be marketed through the 49 branches of the Johns-Manville concern and will have the personal attention of

the 589 managers and travelling representatives connected with that organization.

All of these 49 branches will be equipped as service stations, each in charge of an expert mechanic, familiar with every detail of speedometer construction, for the convenience of dealers and customers. They will be ready for business early in January, and will carry a full line of spare parts, etc.

**CAMERON IN WEST HAVEN.****Well Known Beverly Concern Now Established  
in Its New Connecticut Home.**

Oct. 24 marked the completion of the removal of the plant of the Cameron Manufacturing Company, maker of Cameron cars, from Beverly, Mass., to its new home in West Haven, Conn. The concern expects to have its full quota of men at work within 90 days, and it is anticipated that the new facilities will enable the production of 1000 cars a year.

The West Haven plant is that formerly utilized by the Mathushek Piano Company and comprises practically three buildings and six acres of land. The main structure, 420 by 120 feet, will be known as the assembling and machine department. Another at right angles to this, 325 by 60 feet, will be utilized as the body building, painting and trimming department. The testing building is 150 by 50 feet. Completed cars will not undergo their road test on the public highways, but on a specially constructed track within the grounds.

The Bosch Magneto Company, New York City, maker of Bosch magnetos, through its attorney, has notified the Hendee Manufacturing Company, Springfield, Mass., maker of Indian motorcycles, and the Splittorf Electrical Company, Newark, N. J., maker of the Splittorf magnetos used on Indian machines, to discontinue alleged infringements of patents held by the Bosch concern. It is anticipated that the Hendee and Splittorf companies will deny the Bosch claims and that an important court action will result.

The Speedwell Motor Car Company, Dayton, O., explains that the recent announcement of its Speedwell series H conveyed a wrong impression, in that wire wheels, make not stated, can be supplied at an additional charge of \$100, and that the 37 by five-inch tires are not supplied on the five-passenger models.



## GENERAL NEWS OF THE INDUSTRY.

### Col. George Pope Appointed Receiver for Pope Manufacturing Company—Willys Buys Edwards-Knight Rights and Will Produce Garford-Knight Cars.

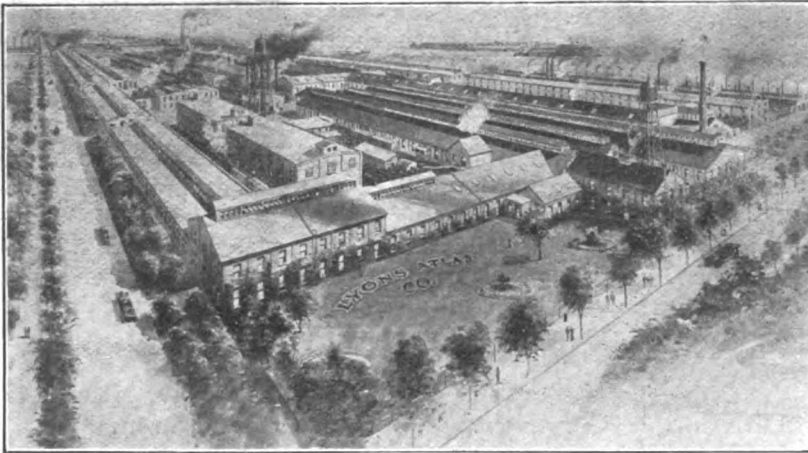
**S**OME little interest attaches to the appointment of Col. George Pope as temporary receiver for the Pope Manufacturing Company, Hartford, Conn., maker of Pope-Hartford pleasure cars and motor trucks and Pope motorcycles, as well as bicycles. Col. Pope has qualified, furnishing a bond of \$200,000, and has been directed to continue the business.

Officials of the company declare that the concern is solvent, and that the principal reason for the present difficulty lies in the fact that the credit of the company was seriously restricted owing to the approaching maturity, April 1, 1914, of an issue of \$1,000,000 of debenture notes, which, under their terms, might shortly become

edly interesting business policy. The company will produce four and six-cylinder pleasure cars under the name of Lyons-Knight, and commercial vehicles. Complete information concerning these latter is not made public at this time.

An accompanying illustration shows the factory. It covers 65 acres and supplies 627,000 square feet of floor space. It comprises foundries, drop forge and die casting plants, and numerous other departments which make it to a great extent independent of outside supply. There are more than six miles of railroad tracks in the buildings and grounds, having direct connection with many railroad systems centring in Indianapolis, and the company has its own locomotives for switching, etc.

The president is James W. Lyons, who has had 25 years of experience in manufacturing and engineering work. The manager of the automobile department is Harry A. Knox, who is well known as one of the pioneer designers in the industry, having previously been connected with the Knox Automobile Company and the Atlas Motor Car Company, both of Springfield, Mass. Among the more recent acquisitions of the company is Frederick P. Nehrbas, who becomes factory manager. He formerly occupied a similar position



Plant of the Lyons-Atlas Company, Indianapolis, Ind.

due and payable. The capital stock of the company is fixed at \$6,500,000. Col. Pope is treasurer, and is well known in the industry through his position as treasurer of the Automobile Chamber of Commerce.

#### LYONS-ATLAS COMPANY.

#### Maker of Lyons-Knight Cars Inaugurates Enlarged Business Policy.

The Lyons-Atlas Company, Indianapolis, Ind., which was organized early in the year to take over the business previously conducted by the Atlas Engine Works of that city, and to produce a Knight engined car, is announcing a decid-

with the American Locomotive Company at its plant in Providence, R. I. Harry Tuttle has gone to the Pacific Coast to establish Lyons-Knight agencies in the Far West, and F. P. Steele, formerly of the Chalmers and Interstate sales forces, will occupy a similar position in the Middle West.

The Lyons-Atlas Company has adopted as its slogan, "The Car of Silence", and aside from the Knight sleeve valve motor, the Lyons-Knight pleasure vehicle line will also make use of a worm driven rear axle. Among the other features are the following: Fuel tank in the cowl dash, left hand drive, centre control, "one-man" top, etc. The body lines are said to present new designs, and the upholstery is very satisfactory.



## JOINS WILLIAMS & CUNNYNGHAM.

### D. Minard Shaw Severs His Connection with Mahin Advertising Company.

D. Minard Shaw, who is widely known throughout the motor car industry because of his special efforts in handling automobile accounts, has resigned from the Mahin Advertising Company, Chicago, to become associated with Williams & Cunnyngnam of that city. The latter concern is also engaged in the advertising business, and it is assumed that its automobile accounts will be increased materially through the acquisition of Mr. Shaw.

While with the Mahin company, Mr. Shaw devoted a large share of his personal attention to the exploitation of the product of the Haynes Automobile Company, Kokomo, Ind., and it is suggested that much of the recent success enjoyed by this pioneer manufacturer has been due to his efforts.

## TO SELL R-C-H PLANT.

### Receiver Advertis That Property Is Ready to Continue Production at Once.

The entire automobile plant of the R-C-H Corporation at Detroit will be sold at a receiver's sale on Nov. 11. It will be offered both in parcels and in the bulk. Subject to revision on the day of the sale the property comprises: Real estate, valued at \$201,000; plant equipment and machinery, \$213,889.75; materials, supplies and branch stocks, \$313,968.28; cars, \$14,530; accounts receivable, \$60,634.58; notes receivable, \$3174; total valuation, \$807,197.61.

The plant is equipped for the manufacture of a five-passenger touring car, is located in the heart of the industry with railroad siding, and is ready to resume business with orders for a large number of machines.

## TO ERECT NEW BUILDING.

### Cole Motor Car Company Begins Construction of Four-Story Addition.

As an indication of the outlook for the coming year, the Cole Motor Car Company, Indianapolis, Ind., maker of the Cole line, reports that it enjoyed an increase of \$1,000,000 during the first quarter of the 1914 season, which included the months of July, August and September. Work has already begun on the construction of a new

addition to the factory, which will involve the expenditure of some \$200,000.

The building will be four stories high, fire-proof and otherwise modern throughout. It is expected that it will afford ample production facilities to take care of the increase in business. Just prior to the opening of the 1914 season the Cole company increased its capital from \$500,000 to \$1,000,000 in anticipation of a decided demand for the standardized model.

## IS MANUFACTURING MANAGER.

### S. H. Humphrey Assumes Highly Important Position with Hupp Company.

Announcement has been made by C. D. Hastings, general manager of the Hupp Motor Car Company, Detroit, of the promotion of S. H. Humphrey, to become manufacturing manager. For some time past Mr. Humphrey has been factory manager, a position in which he has been highly efficient.

With the development and growth of Hupp mobile sales throughout the world there naturally arose several production problems, and it was on account of Mr. Humphrey's excellent record as a production man that he was promoted to the new position, with jurisdiction over both the American and Canadian factories. His duties will include supervision of everything from the raw material to the finished product.

The plant in Windsor, Ont., was established to look after the Canadian market and has been run under separate management, but now it will be under the guidance of Mr. Humphrey and additions and improvements will be made so that it will not only take care of the Canadian business, but will handle practically all the export production of the company.



S. H. Humphrey, Manufacturing Manager, Hupp Motor Car Company.



**WITH COMMERCE COMPANY.****W. S. Pettit Leaves Studebaker Organization to Succeed H. B. Bennett.**

The many friends of W. S. Pettit will be glad to learn of his appointment as sales manager of the Commerce Motor Car Company, Detroit, succeeding H. B. Bennett, who has been promoted to the position of general manager. Mr. Bennett is also vice president of the company, the other officers of which are: President, Walter E. Parker, and secretary and treasurer, George J. Kellogg.

Mr. Pettit is well known in the industry, through his connection with the Studebaker Corporation as advertising manager and because of



**W. S. Pettit, Sales Manager, Commerce Motor Car Company.**

his long and careful training in the automobile business before he assumed that position. His acquaintance with the trade has been acquired during a number of years in responsible positions, and his constructive policy will do much to increase the success of the Commerce company, which was organized some three years ago to produce and market a light delivery wagon.

**BUYS EDWARDS-KNIGHT RIGHTS.****John N. Willys to Produce Models Under the Name of Garford-Knight.**

John N. Willys, president of the Willys-Overland Company, Toledo, O., announces that he has purchased the plant and all license rights, stock and equipment of the Edwards Motor Car Company, New York City, which was organized something like a year ago to manufacture the Edwards-Knight car. Mr. Willys states his intention of building the new cars, which will be

known as the Garford-Knight, in the big and modernly equipped plant which he owns at Elyria, O.

The Edwards-Knight presented a number of innovations, insofar as American design was concerned, among which were the worm drive, four-speed transmission, Lanchester spring suspension, wire wheels, etc. It is not made plain whether the new Garford-Knight will include all of these features. It is stated, however, that H. J. Edwards, designer of the Edwards-Knight, has been retained by Mr. Willys and will go to Elyria as chief engineer, directing the production of the latest acquisition.

**NEW STOCKHOLDERS ADDED.****Well Known Advertising Agency Strengthens Its Facilities for Service.**

The Franklin P. Shumway Company, Boston, Mass., one of the oldest advertising agencies in that city, is increasing its field of usefulness by the addition of a number of new stockholders. The business was established some 30 years ago by Franklin P. Shumway, who celebrated his 57th birthday recently by announcing the culmination of plans which he has had under way for a number of years.

The new men, who will be associated with Mr. Shumway in conducting the business in the future, are: Charles P. Randall, D. J. MacNichol, R. D. Clinton Jordan, Willis P. Shumway, Arthur H. Merritt, Carl E. Shumway and Carl L. Fife. Each of these has had a thorough experience in the advertising field and their addition to the staff of this enterprising concern will still further establish its reputation with the automobile industry, numerous accounts in which it has handled with decided success in the past.

**ADOPTS NEW WAGE SCALE.****Ford Workmen to Be Graded Under Decidedly Interesting Plan.**

A general increase in the wages of the employees of the Ford Motor Company, Detroit, of not far from 13 per cent., has resulted from a specific grading of the operatives recently established. There is a further sub-division of the grades, which includes employees who receive higher wages on account of long service with the company. The plan fixes a wage for the different classes of workmen from which no deviation may be made.



## NEW AND NOVEL ACCESSORIES THAT APPEAL TO MOTORISTS

**Parker Vaporiser.**

The Parker Manufacturing Company, Broad street and Ridge avenue, Philadelphia, is marketing the Parker vaporizer, which is inserted between the carburetor and the intake pipe, where it forms its own gasket. It is designed to break up any particles of raw fuel not vaporized by the carburetor, and convert these into a useful mixture. This is accomplished by means of a rotary motion imparted inside the conical mesh screens, and the maker states that in tests it has saved over 25 per cent. in fuel, and that it makes for a more flexible motor.

**J & B Magnet Lift.**

The J & B Manufacturing Company, Pittsfield, Mass., well known maker of ignition specialties, has brought out a useful as well as practical tool for removing parts, such as bolts, nuts, pins, etc., that are dropped into the engine pan or other places not easily accessible with the hands, etc. It comprises an electromagnet in sections, having a handle containing a switch for opening and closing the circuit between the device and the battery. These sections are so constructed as to carry the current from the handle to the magnet end without wires, and as the electromagnet is always at the end of the tool, maximum lifting power is provided at the

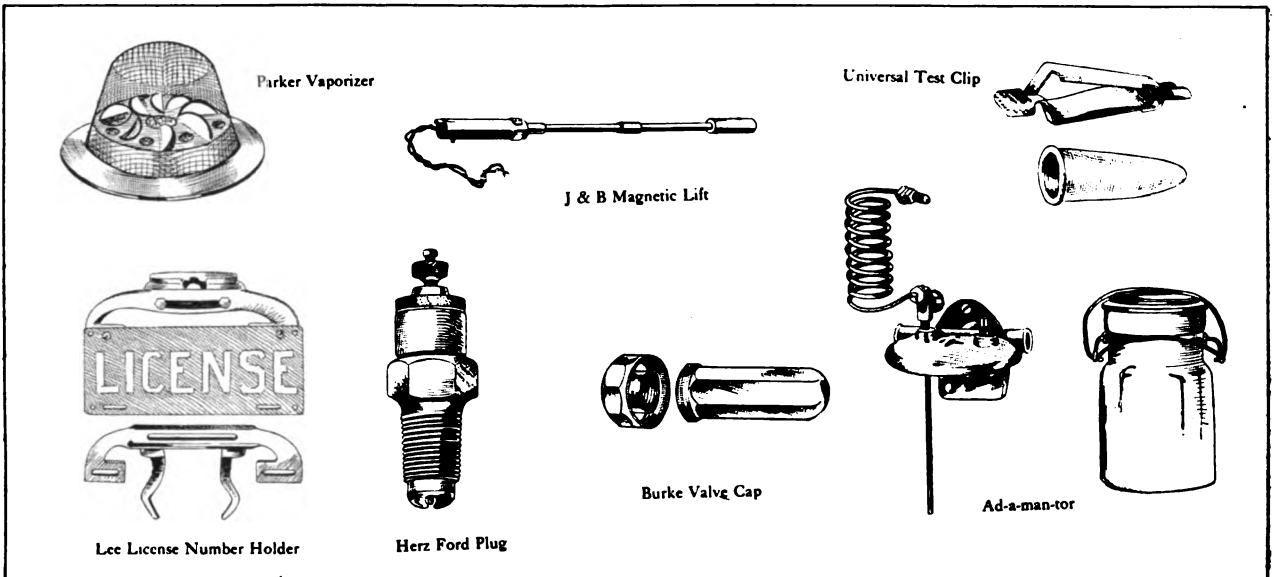
It is stated that the "bite" is positive, that the clip will stand straight out wherever applied and that it will not sag down and make contact with adjacent lugs or terminals. The outer members are No. 20 gauge, semi-hard, cold rolled steel with inner construction of blued spring steel, with the point of application near the jaws. The wire is secured to the heel of the clip and soldered, after which the lips are compressed, making a tight connection. A rubber nipple is fitted, preventing opportunity of shocks.

**Herz Ford Spark Plug.**

Herz & Co., 295 Lafayette street, New York City, maker of the well known Herz Bougie Mercedes spark plugs, is manufacturing a special type for model T Ford automobiles, which embodies the same characteristics of the other plugs produced by this company. The Herz plug has a double, unbreakable stone insulation, blue enamelled, and the four sparking points are of a platinum alloy. One of the several features of the new plug is that it is held to be self-cleaning. It carries a year's guarantee. It is stated by the maker that excellent results are obtained with this plug in the Ford motor.

**Burke Valve Cap.**

The Burke Valve Cap Company, Cleveland, O., is manufacturing the Burke valve cap, which differs materially



service end. The device is designed both for the repair shop and owner and with it metal chips may be removed from the transmission, etc., and the maker states that it has sufficient power to lift valves from the cylinder heads. The tool weighs complete but 12 ounces, has a lifting power of 12 pounds, consumes but half an ampere of current, and may be utilized with any six-volt battery.

**Lee License Number Holder.**

The William O. Lee Company, Port Huron, Mich., is manufacturing the Lee license number holder, which is made adjustable to fit all sizes of filler caps, it being designed to be attached to the radiator. The retaining clamps slide in a slot and are locked by means of bolts and nuts. The holder is also adjustable to plates of varying dimensions. It weighs six ounces, comes polished and is inexpensive.

**Universal Test Clips.**

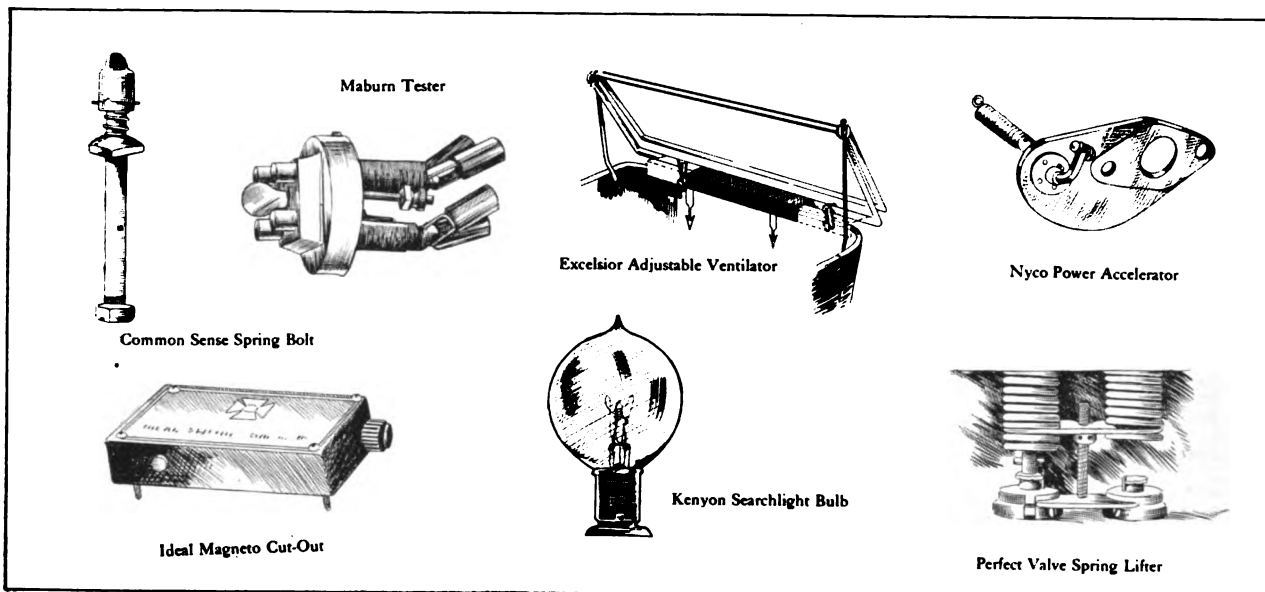
R. S. Mueller & Co., 423 High avenue, Cleveland, O., is manufacturing the Universal test clip, which is designed for use with testing devices where a ready means of making a quick or test connection is desired. It is also of service in charging batteries and the maker states the clips will carry 10 to 12 amperes continuously without heating. The construction of the device is shown in an accompanying illustration and it will be noted that the nose is thin, making for convenience in tight places.

from the conventional device, in that it may be removed and replaced quickly. The cap proper, instead of screwing on to the body of the valve stem, threads into the retaining nut, the last named member having a small number of threads, but sufficient to hold the cap securely, as well as to prevent the entrance of foreign elements. The nut replaces the usual member and the cap is made hexagonal, permitting of the use of a wrench instead of pliers.

**Ad-a-man-tor.**

The Hendricks Ad-a-man-tor Company, Grand Rapids, Mich., is marketing the Ad-a-man-tor, which differs materially from other motor cleaning and priming devices, as will be noted by an accompanying illustration. In the first place the vessel containing the cleansing and priming fluids is of flint glass and resembles the preserve jar in shape and construction. It has the wire clamp for securing the top member, and the method of operation is similar to that of the fruit jar. The top part is secured on the hood side of the dash and an operating disc or button is located on the driver's side. Extending into the container is a small tube through which the fluids are drawn by the suction of the piston. Connecting with the tube is suitable piping, which is led to the intake manifold just above the carburetor. Two jars accompany each equipment, one being utilized for the cleansing material, which is said to effectually remove carbon and other deposits from the cylinders. The second jar is





utilized for carrying a priming mixture. One of the features of the system emphasized is the ease with which the containers may be changed.

#### Common Sense Spring Bolt.

Spring bolts are subjected to considerable friction and, if not provided with means for proper lubrication, wear rapidly, to say nothing of being the cause of squeaks and rattles. Many early types of machines are fitted with bolts which are so constructed as to make proper lubrication difficult, and to overcome this trouble the American Ball Company, 115 Clifford street, Providence, R. I., has brought out the Common Sense spring bolt, which is constructed of a high grade material, carefully finished and equipped with a wing cap ratchet grease cup.

#### Maburn Tester.

The Mapes & Maburn Manufacturing Company, 16 Fulton avenue, Rochester, N. Y., is marketing the Maburn tester, which is a neat and compact device for locating ignition troubles from the seat. It comprises a dash switch having buttons, these corresponding to the number of cylinders, also a key. Individual wires lead from each spark plug to terminals on the switch, and turning the key and pressing a button short circuits or cuts out the current to the cylinder. This permits the driver to locate easily a faulty cylinder and the operation obtains similar results as when holding down a vibrator of a coil. As a missing cylinder is located without lifting the hood it is obvious that considerable labor and time are saved. Another advantage of the device is that the tests may be conducted with the motor under load. The maker points out that the tester is valuable in locating knocks, etc. The Maburn tester is moderately priced, comes in polished brass or nickel plate finish and is easily installed.

#### Excelsior Adjustable Ventilator.

C. B. Wattles, 441 Butler Exchange, Providence, R. I., is manufacturing the Excelsior adjustable ventilator for model T Ford automobiles, which is an inexpensive device and easily attached to the dash in conjunction with the windshield. It provides proper ventilation of the front compartment of the machine, the air being deflected in such manner that there are no draughts. The ventilator is easily adjusted to two widths of openings or may be closed as suits the convenience of the operator, and it can be set while driving. The value of the device is obvious, as it maintains a comfortable temperature and eliminates the heat from the motor. The ventilator is finished in black enamel.

#### Nyco Power Accelerator.

The New York Coil Company, 338 Pearl street, New York City, maker of ignition specialties, has brought out a new accessory for model T Ford automobiles, called the Nyco accelerator and power adder. It consists of

a hollow chamber made of nickel steel, .25 inch thick, registering with the opening in the inlet pipe and carburetor, also the two flange bolts retaining these members. One end of the device conforms to the shape of the carburetor flange, but the other end extends a distance beyond the flange and contains a peculiarly arranged valve of approximately the same area as the inlet pipe opening. Air passages are formed in this valve in such manner that when the valve is moved from its seat, by means of a steel wire connecting with a pedal in the rear foot board, air is admitted to the inlet pipe, as no obstructed passage is provided between the valve and inlet pipe connection. The valve is supported on a rod, which is carried by a valve guide on the opposite side of the device. Two different sized springs are utilized, one a light member to keep the valve normally seated, and a heavier spring which comes into action only when the pedal is depressed, as when descending a grade. This permits fresh air to pass through the cylinders and serves as well as a brake. The main object of the device is to supply air to over rich mixtures, as when the car is speeded up. It is stated by the maker that the Nyco effects a saving of 25 per cent. in fuel, prevents carbon, keeps the motor much cooler and makes for more flexibility.

#### Ideal Magneto Cut-Out.

The Ideal Switch Company, Inc., Plainville, Conn., is manufacturing the Ideal magneto cut-out, which is a neat, well constructed switch for use with high-tension magnetos. The maker states that the switch is sturdily made and that the phosphor bronze springs will not lose their elasticity in service.

#### Kenyon Searchlight Bulb.

The Kenyon Searchlight Company, 15 Woodbridge street, East Detroit, Mich., is manufacturing the Kenyon searchlight bulb, which is designed to eliminate the side lights and to conform to the ordinances prohibiting the use of headlights. This is obtained by the use of a double filament, one being employed to project the parallel rays while the second member is diffusing and throws the reflection directly on the road. The short range light is of distinct value when traversing country roads, etc., and with the other filament provides an effective lighting arrangement.

#### Perfect Valve Spring Lifter.

Winton L. Smith, 78 Clinton street, Newark, N. J., is the inventor of the Perfect valve spring lifter, which differs from conventional design in that the valves may be ground without displacing the valve springs. It lifts and compresses two springs at once, a yoke being actuated by a nut on a screw member, the last named being secured to a bed plate. It is particularly adaptable to Winton motors and the maker states that it is possible to reach the springs of the number 4 cylinder without displacing the magneto.



**Springfield Tire Rest.**

Tire manufacturers advise relieving the shoes of all weight when the machine is not to be used for any length of time. The Shawver Company, Springfield, O., is producing the Springfield tire rest, which is constructed especially for jacking up cars, although it may be employed for a number of useful purposes. One of the features of the Springfield is that the car may be raised to a height of six inches if desired, or fractions thereof. The rest is sturdily constructed, has a lifting capacity of 8000 pounds, and can be used under cars with wheel diameters of 28 to 48 inches. The adjustments are quickly made and the lever easily operated. The Springfield tire rest comes in sets of four.

**B'Co Spark Plug.**

The Brown Company, Syracuse, N. Y., is producing a special spark plug for use with the Brown Impulse tire pump made by this concern. The Brown pump is inserted in the spark plug opening and operated by the impulse of the compression stroke. The early types produced were threaded for screwing into the cylinder opening, but with the new plug the work is greatly simplified. The B'Co spark plug has a removable core, which is displaced by a slight turn of a handle. The pump is then inserted in the base or shell member, to which it is secured by a bayonet type of lock, a slight twist fitting and releasing the components. The company makes an attractive offer to owners of the earlier types of Brown tire pumps not equipped with the quick acting device.

**Apco Ford Gaskets.**

In fitting new gaskets to the intake, exhaust and water manifolds care should be taken to employ a high grade material and one that will resist the action of heat and water. While gaskets may be made, considerable time is saved by utilizing those designed for the motor. The Auto Parts Company, Providence, R. I., maker of Apco specialties, is marketing a complete set of gaskets for the model T Ford, including the cylinder head member, inlet, exhaust, cylinder head flange, inlet and exhaust water, and transmission drain plug. These gaskets are made of the very best material and carefully constructed. They are guaranteed to fit, and the complete set is inexpensive.

**V Hot Air Valve.**

The benefits accruing from the utilization of heated air in the carbureting of gasoline are well known, and many manufacturers equip their cars with a hot air device. A different application of the principle is noted in the V hot air valve produced by the V Air Valve & Manufacturing Company, 1648 Tremont street, Denver, Col. It comprises a hood like member, which is clamped onto the exhaust manifold; flexible metallic tubing for conveying the heated air, and the V valve. The last

named member is screwed into the intake manifold above the carburetor and control of the valve is by a wire cable operated by a lever clamped to the steering column under the wheel. This permits the driver to regulate the amount of air admitted according to atmospheric conditions, etc., also to utilize the control for flushing out the cylinders with fresh air, as when coasting down a hill. The maker states that considerably more mileage is obtained to a gallon of fuel and that further economy is obtained in that at high piston speeds the emergence of fuel from the jet is restricted without affecting the output of the motor.

**Breeze Tank Valve.**

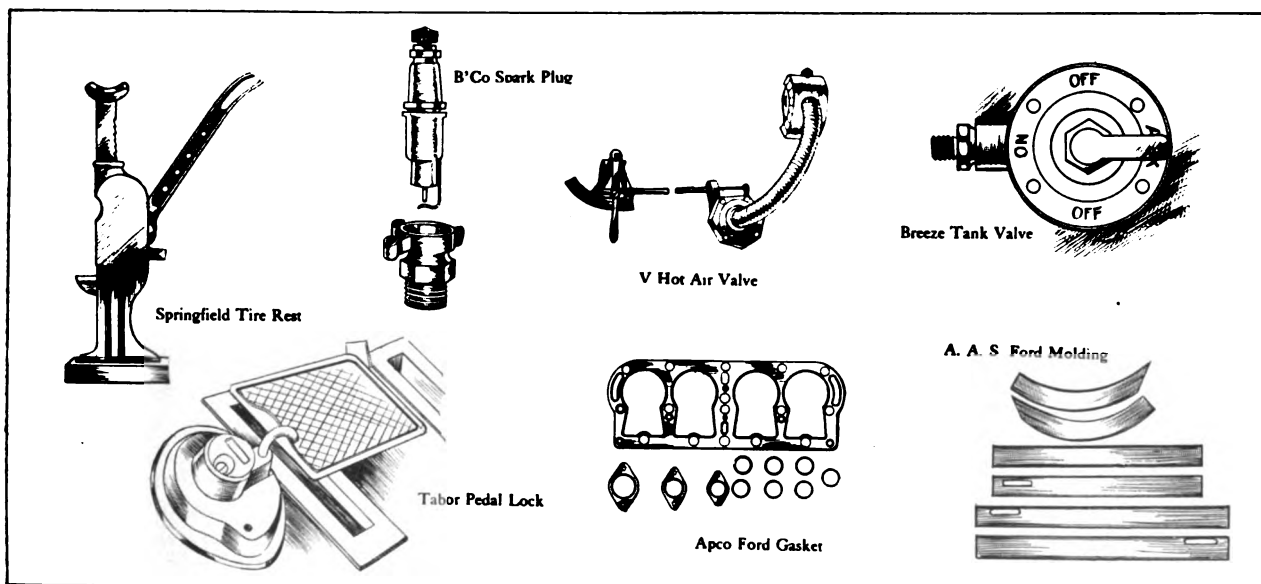
The Breeze Carburetor Company, Newark, N. J., is marketing the Breeze 4 in 1 tank valve, which obtains the reserve capacity of fuel without the auxiliary tank in the fuel container. Two outlet levels are utilized in the tank, the service member being slightly higher than the reserve, and according to requirements. Two controls are provided, one for each outlet, also two off positions, connection between the indicating plate and valve proper being made by a rod arrangement. The valve is provided with a gauze strainer, also a screw plug member for cleaning and draining. One of the features of the valve is that it may be locked, preventing use of the car by others than those intended.

**Tabor Pedal Lock.**

The large number of cars reported stolen has led to the marketing of a number of locking devices, among which is the Tabor pedal lock, manufactured by the Loveley Sales Company, Detroit. It is a mechanical arrangement, which comprises a plate member having a lock and being fitted to the toeboard. Included in the mechanism is a hook which may be swung inward and locked, thereby retaining the clutch pedal, as shown in the illustration. With the clutch out and pedal locked, it is obvious that the car cannot be operated under its own power. The equipment includes a high grade lock with removable key and the construction is very compact. It is stated that it does not interfere with the normal use of the clutch pedal.

**A. A. S. Ford Molding.**

The American Auto Supply Company, 1741 Broadway, New York City, is marketing a molding assembly for model T Ford cars, which consists of a complete set of mahogany finish moldings for placing on the top edge and doors of the body. These pieces come cut to the exact length to fit and screws and washers are supplied with each set. It is pointed out that the moldings can be fitted in about 15 minutes and that they add materially to the appearance of the car, as well as protect the body material. The A. A. S. Ford molding is made for the 1912 and 1913 runabouts and touring models.

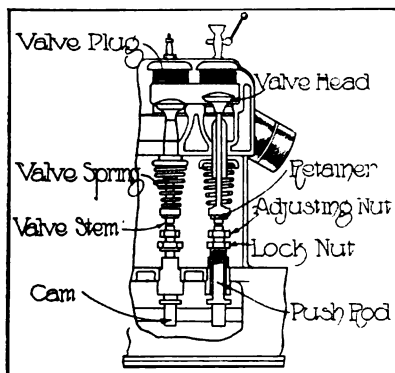




# MECHANICAL INSTRUCTIONS FOR NEW OWNERS.

## Adjusting Abbott-Detroit Valve Mechanism--Operation of Model T Ford Carburetor --Overland Mechanical Lubricator--Velie Rear Axle Adjustment.

**I**MPROPERLY adjusted valves result in inefficiency. If the intake opens late, a maximum charge is not obtained, and with the exhaust opening late, the burned gases are not wholly expelled. Consequently after the machine has seen considerable service, the adjustment of the valves should be checked up, not by guess work, but by timing marks



Abbott-Detroit Valve Mechanism.

on the flywheel. In an accompanying illustration is presented the adjusting mechanism of the 1912 and 1913 Abbott-Detroit cars, models C 44, D 34-40 and E 44-50, the sketch showing the cylinder and crankcase cut away to depict the components.

The maker recommends that all adjustments be made when the motor is cold and this may be explained by the fact that the proper clearance between the valve stem and tappet is .004 inch when the cam is not lifting the pushrod. The valves of each cylinder must be adjusted separately and should be by the marks on the flywheel. The figures may be noted by removing the cap or plug in the top of the flywheel housing and holding a small mirror at a proper angle over the opening. If the petcocks are opened, or the spark plugs removed, the flywheel may be rotated easily.

It will be noted that the flywheel carries the figures 1 and 4, also a centre line, and the last named mark should register with a line drawn across the centre of the flywheel housing. With these lines coinciding the piston of the first cylinder (that nearest the radiator) should be at the top or dead centre (compression). Next rotate the flywheel in the normal direction 2.234375 inches. This should result in the line on the flywheel marked 1 4 registering with the centre line of the housing previously referred to.

The pushrod should be in contact with the

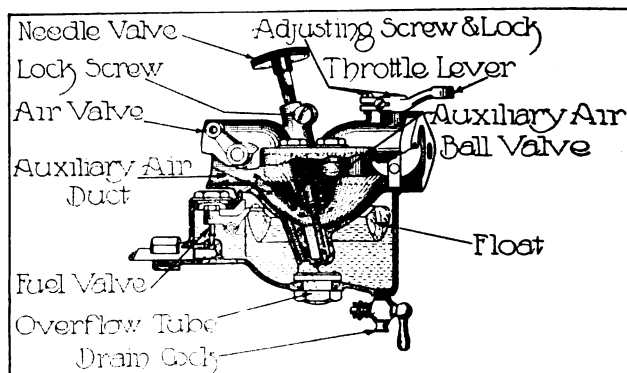
end of the intake valve stem. If not the lock nut is loosened and the adjusting nut turned to the left until the tappet member makes contact with the valve stem. In loosening and tightening the lock nut be careful not to exert uneven pressure on the parts. It is best to use two wrenches, holding the adjusting nut firmly and turning the locking nut with the other tool.

The closing of the intake is next checked. Turn the flywheel a trifle over half a turn and past the line marked 1 0 2 3 until that bearing the figures 1 0 1 4 approaches the housing line, and coinciding with the mark the intake should be seated. If it be found that the tappet does not engage and release with both the open and closed flywheel lines coinciding with the housing mark, the maker recommends splitting the difference, or centring the cam, as it is called. That is to say, if the valve opens correctly but closes late, move the flywheel back to the opening point and readjust the valve until it opens .0625 inch earlier.

The intake of the third cylinder is then adjusted, and after that, the fourth and the second, as the firing order is 1, 3, 4, 2. The exhaust valves are checked in a similar manner.

### MODEL T FORD CARBURETOR.

Some operators of model T Ford cars, especially beginners, utilize too rich a mixture,



Sectional View of Model T Ford Carburetor, Showing Relation of Parts to One Another.

thereby wasting gasoline, to say nothing of soot-ing up the motor, causing it to heat and miss at low speeds. In an accompanying illustration is



shown a sectional view of the carburetor with the components lettered and a little study of the parts will be of service in obtaining maximum results. A mixture, so-called,

comprises so many parts of air to fuel. The air is necessary to combustion and with too much air the charge ignites and burns slowly. Too much air is denoted by back-firing and this condition should be corrected, as it is dangerous and apt to set the fuel in the carburetor on fire. While a slightly rich mixture makes for easy starting, too much gasoline will cause difficulty in starting and missing at low speeds.

There is but one adjustment to the carburetor, that of the fuel, it being obtained by the needle valve, which is rotated to the right to decrease the supply and in the opposite direction to provide more gasoline. With this design the setting of the needle valve at low speed is important, for with the increase in the opening of the throttle, auxiliary air is supplied by a ball valve, this member operating automatically. The air enters by a duct which is fitted with a valve for starting purposes. Closing this valve by means of the wire extending through an opening in the radiator causes a rich mixture to pass to the cylinders, as the supply of air is restricted. The other lever, marked "throttle" in the drawing, controls the amount of mixture passing to the cylinders. The float maintains the proper level of fuel and the fuel valve regulates the flow from the tank to the float chamber, it opening and closing during operation of the motor.

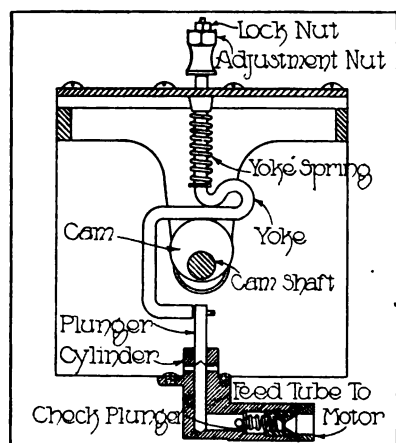
As that part into which sets the point of the needle valve is very small when the carburetor is adjusted, it follows that any particle of dirt will clog it easily and make starting difficult. If dirt be suspected of causing the trouble, move the switch lever to neutral, screw down the needle valve, then open it several turns, and spin the motor. This will sometimes clear the spraying nozzle. Often the obstruction can be removed by opening the petcock and draining off about half a cupful of gasoline. In connection with drain-

ing, it is recommended that the petcock under the tank be opened occasionally. This should be done even when care is taken to strain all fuel used.

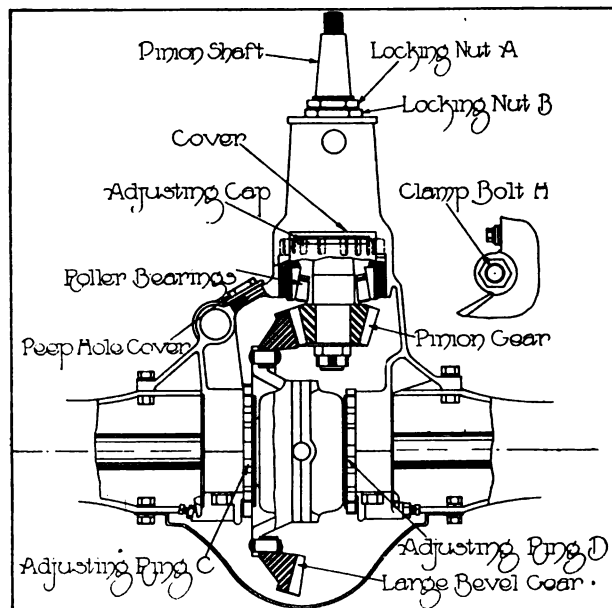
The best method of adjusting the carburetor is by rotating the needle valve to the right or left, cutting down or increasing the supply of fuel, and noting the effect of the alterations with the motor under a load. The odor of the exhaust should also be noted, and if it be pungent, that is, if it have an acrid smell, it denotes too rich a mixture. Cut down the gas slightly until the exhaust smells "sweet". While a light or lean mixture is advisable and makes for economy, it should not be so lean as to affect the operation of the motor. For starting, some owners open the needle valve from half to a full turn, returning it to the original setting after the motor becomes warm. Too much gasoline will prevent starting, and when this is the case, the needle valve should be fully closed and the motor spun. This will displace the rich mixture in the cylinders.

### ADJUSTING MECHANICAL OILER.

The oiler utilized on the model 69 Overland car is of the mechanical type and has six leads, one for each of the four cylinders, the timing gears and crankcase. Any of these leads may be



Overland Mechanical Oiler.



Components Utilised in Adjusting Gears and Bearings of Velle Rear Axle.

adjusted and the operation is a simple one. By referring to the sectional drawing it will be noted that the mechanism comprises a yoke to which is



secured a plunger. The last named member is raised by a cam, actuated by the camshaft. With the plunger at the top of the stroke, oil enters a passage, and upon the plunger descending, the lubricant is forced past a check member to the feed tube leading to the part to be lubricated. By shortening or lengthening the stroke of the plunger, which is accomplished by loosening the check nut and turning the adjusting member up or down, the supply is increased or decreased as desired.

Clogging of the feed tubes is generally indicated by the plungers remaining up, and usually the obstruction can be removed by working the plunger by hand. The operation of the oiler may be noted by watching the plungers rise and fall.

### VELIE REAR AXLE ADJUSTMENT.

As the rear axle of the car is adjusted properly at the factory, it will require no attention, other than replenishing the supply of lubricant as instructed by the maker. There are three conditions which may arise and which may make adjustment of the gears necessary, these being objectionable noise, back lash and looseness between the bearings on the pinion shaft of the differential.

In an accompanying illustration are shown the components utilized in making adjustments to the rear axle of the Velie car, the parts being lettered for identification. Assuming that the bevels hum unduly and one desires to eliminate the objectionable noise: The first step is to loosen the locking nut A on the pinion shaft, also the nut B. Next displace the cover, loosen the clamp bolt H, turn the slotted adjusting cap toward the left one notch and tighten up nuts B and A, taking care not to have bearings so snug that the shaft will not rotate easily. If upon trying out the car the noise is found to be diminished, but not wholly eliminated, loosen nuts A and B and rotate the adjusting cap another notch and so on until the quietest point is secured. If it is found that the noise is augmented, adjust in the opposite direction. As arrows show the direction of adjustment it should be made without trouble. Upon making the final adjustment, and there is no end play to the shaft, back off nut B a quarter turn and tighten up on nut A. Bend the washer over the flat of each nut, tighten up clamp bolt H and replace cover.

To remove back lash of the gears, back off adjusting ring at D toward the differential and turn the ring at C against the bearing cap, which will move the gear toward the pinion. These

rings have a right hand thread. Before turning the rings, however, loosen the cap screws on the bearing cap one-half turn, after removing the locking wires. The proper amount of back lash should be approximately .005 inch, or a barely perceptible looseness. After the work is completed, make sure that the locking pins are back in the slots of the rings, that the cap screws are tight and the locking wires in place. After making adjustments care should be taken to renew the supply of lubricant, and according to the directions of the maker of the car.

Looseness in bearings on the pinion shaft is eliminated by easing nut A and taking up on nut B, just enough to allow the shaft to rotate freely without end play. By backing off nut B about a quarter inch the right adjustment should be obtained. Relock nut A. If noisy gears result, the same methods should be pursued as already outlined. Play in the differential bearings is removed by the adjusting rings C and D, the position of these being changed until end play is eliminated and the differential rotates freely. The cap screws and locking wires will require attention as when removing back lash. In the case of back lash resulting from the work, it may be removed as previously explained. If it be found that the gears are too far out of mesh, or new members must be fitted, set the gears with the backs flush as a starting point and follow the directions outlined above. The position of the teeth may be ascertained by removing the peep hole cover shown the drawing.

### MOTOR CAR LIGHTING.

**Prest-O-Lite Company Issuing Free Booklet Analyzing Present Methods Employed.**

The Prest-O-Lite Company, Inc., Indianapolis, Ind., maker of the well known Prest-O-Lite gas tanks, is publishing a booklet entitled "Power and Fuel Consumed by Electric Lighting Apparatus," which contains an analysis of the cost of operation, maintenance and efficiency of electric lighting and motor starting system, also data on its own method of lighting. The company conducted a series of tests with various electric lighting equipments, the results of which are tabulated and presented in such manner as to be understood easily by the novice. The company will forward its booklet and a full report of the tests referred to upon receipt of a postal card. The address of the Prest-O-Lite Company, Inc., is 226 Speedway, Indianapolis, Ind.



## WITH THE MOTORING INTERESTS ABROAD.

### New British Electric Motor Starter Bears Name of Well Known Maker of Lighting Systems---Racing Driver Outlines Plan for Track in France.

**E**LECTRIC motor starters are being given consideration by English manufacturers of electrical equipment for motor cars, announcement being made of the C. A. V., the invention of C. A. Vandervell and A. H. Midgley, of London, England. Mr. Vandervell is of the well known C. A. Vandervell & Co., maker of lighting systems which were described in The Automobile Journal in the issue of Dec. 25, 1912.

The motor starter and the components of the system are shown in an accompanying illustration and it will be noted that the energy of the motor is imparted to the flywheel of the engine by means of a friction roller C. It is actuated by a pedal E and suitable linkage, and depressing the pedal pulls the friction roller into engagement with the periphery of the flywheel D. As the pedal is depressed it closes a double switch F, connecting the battery with the motor. The shaft B is fitted with two flexible leather universal joints. A free wheel clutch G permits the engine to overrun directly it starts under its own power. The friction clutch member is secured to the chassis frame by a special bracket, as will be noted.

#### ADOPTING NEW METHODS.

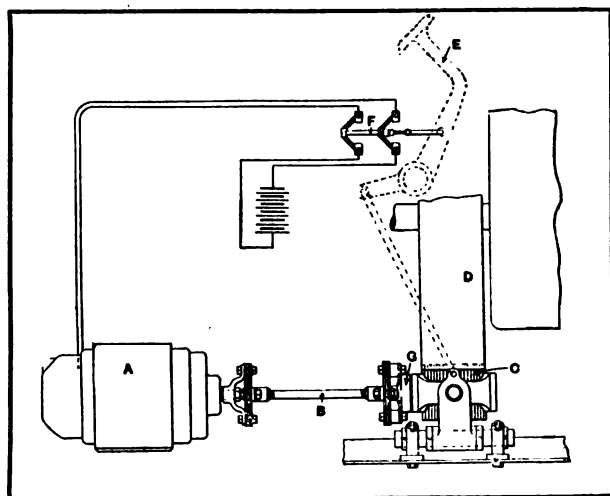
#### French Car Manufacturer Sends Fleet of Cars Throughout Russian Empire.

The success which has attended the adoption of long distance road trials by British manufacturers of automobiles, appears to have been still further reflected in the recent action of a French concern, which sent three of its latest models on a demonstration trip throughout Russia. These machines left Paris by way of Brussels, Amsterdam, Bremen, Hamburg, Copenhagen, Goteborg, Christiania, Stockholm, Riga, Revel, St. Petersburg, Moscow, Nizhni Novgorod, Samara, Aratof, Astrakhan, Petrovsk, Vladikavkaz and Tiflis to Batum, and returned by way of the Black Sea coast, the Crimea, Odessa, Kief, Vienna and Berlin.

In making report concerning this remarkable trip Consul Leslie A. Davis, at Batum, suggests that manufacturers of American automobiles, who wish to do business in this region, might find

it worth while to try some similar method of introducing their machines, as it is almost impossible to interest people there unless they can actually see the article. He adds that there are at present a few American cars in the Caucasus, but it is believed that the district offers a fair market for low priced, medium weight machines.

The roads in the vicinity of Baku are level and good, and the number of automobiles in use there is steadily increasing. It also is reported that there has been a rapid increase in the number of machines, both public and private, that are used on the Georgian military road between Tiflis and Vladikavkas, and on other roads out of Tiflis. It was in this latter city that the French firm in



The C. A. V. Electric Motor Starter, Utilizing a Friction Roller and an Overrunning Clutch.

question was successful in establishing a permanent agency. All of the roads in this particular district are mountainous and Mr. Davis advises that a high powered machine is required and one that is not too low hung.

#### POSSIBILITIES IN VENEZUELA.

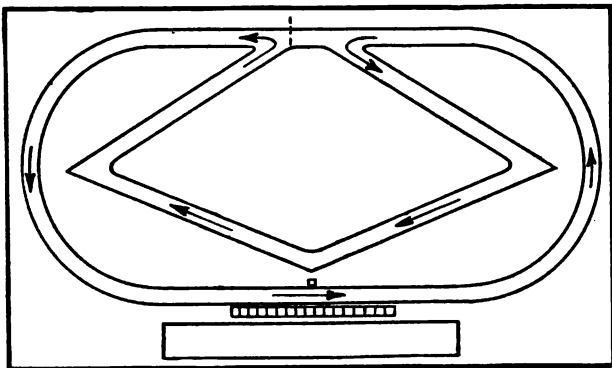
#### Government Good Roads Construction Is Increasing Demand for Cars.

It appears from recent reports of conditions in Venezuela, that the activity of the government in constructing good roads has had an appreciable effect upon the demand for automobiles in



that country. More than half of the cars owned in Venezuela are said to be American manufacture, and the same proportion keeps up with the more recent importations, one steamer bringing 17 machines from New York on one voyage. The light, inexpensive car is said to have had the best sale thus far.

The government is now engaged upon the construction of a road in the western part of the country, from Uraca, the present terminus of the Tachira railroad, southward through the mountains to San Cristobal. This is expected to be of material advantage to the coffee raisers in that region. An extension of the railroad up to the town of Uraca will bring the wagon road in close connection therewith. Coffee is now brought into Maracaibo throughout the year, there to await a favorable opportunity for further transportation, but upon the completion of the road it will be possible to market the coffee immediately after harvest. The improvement of the roads out



**Bablot's Suggested Plan for Racing and Testing Track in France.**

of Caracas and about other cities has brought the automobile into much greater use, both for pleasure and commercial purposes.

### RACING TRACK FOR FRANCE.

**Bablot, Well Known Driver, Works Out an Interesting Combination Plan.**

Evidently the success of Jules Goux and the Peugeot car in the international sweepstakes race on the Indianapolis motor speedway, Memorial Day, has had its effect upon the motoring public in France. In a recent issue, *L'Aero* of Paris presented a plan for a racing and testing track as proposed by Bablot, a racing driver of some little note abroad. It is argued that this should be constructed along the lines of the Brooklands track in Weybridge, England.

An accompanying sketch indicates M. Bab-

lot's idea. The combination of an oval and a diamond offers some novel features. It is suggested that the oval track measure approximately 3.75 miles and the combination about 6.25 miles. Cars would follow the direction indicated by the arrows, and when both tracks were in use a barrier would be placed at the point indicated by the dotted line to prevent drivers short circuiting and missing out on the diamond section. Suitable provision would be made for workshops, etc., and an underground passage, underneath the entrance to the diamond shaped track.

### NEWS NOTES FROM FOREIGN LANDS.

Eighteen nations were represented at the banquet tendered by C. H. Dunlap, export manager for the Hupp Motor Car Company, to the European Hupmobile agents, during the progress of the recent Paris Salon.

At the second meeting of the Institution of Automobile Engineers of Great Britain, Nov. 12, Dr. W. R. Ormandy will read a paper entitled, "Some Experiments with Mixed Fuels, with Special Reference to Alcohol Mixtures".

The first formal automobile contest ever held in China was won by P. F. Ritcher, driving a Studebaker car. By winning the event, an economy run over a 25-mile course, Mr. Ritcher captured the cup offered by the governor-general of Kiachou.

The Royal Hungarian Automobile Club is organizing a reliability tour to cover 1500 miles and to be known as the Carpathian tour. The date has not been decided upon, but it will be held some time early next year, and probably will start and end in Budapest.

In an effort to exceed the world's hour record, held by the Sunbeam at 107 miles 1672 yards, Percy Lambert, well known in this country as a racing driver, was instantly killed on the Brooklands track, Weybridge, England, Oct. 31, while travelling at a speed said to be 114 miles an hour. Oct. 27 he succeeded in securing the 50-mile world's record, covering the distance in 27:02.4.

The report of imports into France during the first eight months of 1913 shows that America occupies second place in the matter of automobiles. Great Britain leads with a total valuation of \$929,000; America, second with \$742,300; Belgium, third with \$331,000; Germany, fourth with \$247,200; Italy, fifth with \$208,000, and Switzerland, sixth with \$119,000.

Sydney A. Friede, a former Detroit newspaper man, now residing in St. Petersburg, Russia, writes the Ford Motor Company that, as a result of a recent trip throughout the empire, he is convinced that the Ford car is decidedly popular with Russians. He declares that 32 per cent. of all the cars in the empire are Fords, and that they are being used in increasing numbers by government officials from St. Petersburg to the Black Sea.

In the recent six-day reliability trial in Morocco, the contest was divided into three classes, aside from the general classification. Paul Riviere in a *Metallurgique* was the winner in the open competition, and also in the class for vehicles selling at less than \$1800. A Delahaye secured the prize in the class for cars selling at less than \$2400, and a Ford in the smallest division, for machines selling at less than \$1200.

The Automobile Club de France has decided to abandon its tire allowance restriction for the 1914 Grand Prix, and in its stead the race will be run under two classifications. In the Grand Prix itself the only limitation will be the maximum weight of the car—1100 kilograms (2425 pounds). The second event will be known as the *Coupe de la Cylindree*, for cars with the same maximum weight limit, but with engine capacity restricted to 4.5 liters (274.6 cubic inches). The distance for each will be between 500 and 565 miles.



## ECONOMIN---A NEW MOTOR FUEL.

**A**NNOUNCEMENTS of new motor fuels have been made with decided frequency abroad, and among the latest of these is Economin, the statement concerning which was made public last month by L. R. L. Squire of Straker-Squire, Ltd., a car manufacturer, on behalf of the Economin Syndicate, Ltd., 6 Old Jewry, London, England. Comparative tests of the new product have been made by the Royal Automobile Club of Great Britain and the Cudell Motor Company of Berlin, Germany.

Mr. Squire explains that Economin has for its basis 80 per cent. of kerosene, which, together with an admixture of certain chemical ingredients, is reduced to a perfect emulsion, in which the nature of the kerosene is changed. It is then submitted to distillation and yields a very efficient motor spirit.

Of course, the identity of the chemical ingredients is not disclosed, but it is stated that the raw materials can always be procured in practically unlimited quantities. It is added that the cost of production is sufficiently low to permit of its sale at a price considerably below that of gasoline. The maker maintains that no adjustment of the carburetor is necessary after using gasoline.

The chief advantages claimed for the new fuel are three, as follows: That it can be produced at a cheaper cost than its competitors and sold cheaper to the consumer; that by its use a greater amount of power can be had from an engine of given capacity, and that the foregoing increased power can be obtained from a reduced consumption. Other advantages claimed include: Perfect combustion in the engine, practically no carbon deposit on the cylinder heads or pistons, a perfectly neutral fluid, colorless, practically odorless and absolutely free from any objectionable smell, and easy starting.

It appears that a series of tests was conducted by the Royal Automobile Club of Great Britain, between Sept. 11 and 29, some time previous to the public announcement to which reference has been made. The certificate of performance, after giving the results of distillation tests of the three casks of fuel submitted, two of which (those used in the road trials) were of specific gravity of .766 and the third .760 at 15.5 C continues:

The trial was divided into three parts: One thousand miles on the road on Economin, 1000 miles on the road on ordinary motor spirit (No. 1 Shell), and comparative tests at Brooklands.

The car used in each case was a 15 horsepower (18.8 R. A. C. rating) 1911 Straker-Squire, the engine dimen-

sions of which were 87 mm by 120 mm (3.42 by 4.72 inches). The weight of the car was 2552 pounds, the running weight (with load) being 2855 pounds.

The trial was held on the club's standard routes, and the conditions for each 1000 miles were similar, except that the weather was somewhat finer and the roads consequently slightly better during the test with Shell spirit.

The lubricating oil used in the engine was measured during each of the 1000-mile tests, and was found to be 2.9 gallons and 3.8 gallons with Economin and No. 1 Shell, respectively.

At the conclusion of each road test the engine was dismantled and examined, and the carbon deposit upon the cylinder head removed and weighed. In both cases there was practically no deposit except in the case of two of the piston heads, which had a very small amount, and which showed signs of excessive lubrication. All the valves and plugs were somewhat sooty in both tests. After both tests it was found that two of the exhaust valves had not been seating properly.

At the conclusion of the road tests comparative tests with the two fuels (without intermediate carburetor adjustment) were made on Brooklands track.

The following are the results of the tests:

|                                     | Economin | Shell    |
|-------------------------------------|----------|----------|
| Miles run .....                     | 1000.375 | 1000.375 |
| Average speed, mph.....             | 19.9     | 19.7     |
| Fuel consumed, gals.....            | 44.54    | 44.86    |
| Consumption, miles a gallon.....    | 22.53    | 22.38    |
| Ton-miles a gallon .....            | 28.72    | 28.52    |
| Weight of carbon, deposit grains... | 32.4     | 53.4     |

### Speed Test, Brooklands.

|                            |       |       |
|----------------------------|-------|-------|
| Flying half-mile, mph..... | 48.77 | 48.49 |
| Hill climbing, mph.....    | 10.83 | 10.56 |

The result of the comparative tests conducted by the Cudell Motor Company of Berlin, in which three kinds of fuel were employed, was reduced to the following:

|   | Economin | Gasoline | Benzol |
|---|----------|----------|--------|
| Efficiency in horsepower.....                 | 15.30    | 15.35    | 13.94  |
| Consumption a horsepower-hour,<br>grams ..... | 324      | 364      | 454    |

In discussing the new fuel, Mr. Squire says:

We are quite satisfied that enough has been done in the way of satisfactory and convincing tests to prove the high commercial value of our patents, and we are now engaged in laying the foundation of an important industrial enterprise. Ample capital for carrying out our programme is already secured, and we will, without delay, proceed to erect the necessary buildings for the housing of a plant capable of turning out 20,000,000 gallons of Economin a year. Good progress has already been made in perfecting the organization for an efficient and complete system of distribution.

Prof. Lewes, recognized in Great Britain as an authority on motor fuels, confirms Mr. Squire as to the commercial and chemical aspects of the new compound, laying particular stress upon the fact that the statement that 80 per cent. of kerosene goes into the compounding of Economin does not necessarily imply that it existed as kerosene in the finished product. He adds that the tests prove that the fuel is not sensitive to stalling; that is to say, it is not a mixture of kerosene and lighter spirits which give easy starting when the mixture is fresh and which evaporate when the engine is standing, but is a stable chemical compound.



## CORRESPONDENCE WITH THE READER.

**Electric Motors.**

(1665)—As I am interested in automobile electric motor starters, will you please explain how electricity by flowing in an electric motor makes it revolve?

LOUIS SAPELLY.

Bridgeport, Conn., Oct. 25.

In considering the electric motor, it is understood that the pole or field pieces represent north and south poles, between which a magnetic current will flow, or is flowing. But the field pieces are not permanent magnets and unless there is residual magnetism, or unless there is a certain amount of electricity that will excite them, there is practically no flow of energy. When energized the pole pieces create a magnetic field, and it is this field that, acting upon the conductor moving within it, exercises the propulsive effort. The principle is that a conductor carrying an electric current has a tendency to move if placed within a magnetic field.

Were there no conductor there would be an uninterrupted flow of current from the north to

force is increased, the magnetism being forced through the wire. The turns of wire intensify the current, and when they are arranged so that their effect on each other produces motion the power resultant is proportionate to the magnetic influence caused by the arrangement of the coils and poles, and, of course, the speed of rotation.

When the lines of force of two fields meet and seek to establish parallelism, the arrangement is tangential with reference to the lines of one field, and in the case of the electric motor the lines of force pass from the north to the south pole through the armature core. When the armature core is wound with wire it may have a number of positions with reference to the vertical or horizontal plane.

To illustrate this it may be well to consider several positions, the first of which may be with the coil in the horizontal plane, as shown at Fig. 1. Assuming that the coil has not influenced the magnetic field, the lines of force pass from the

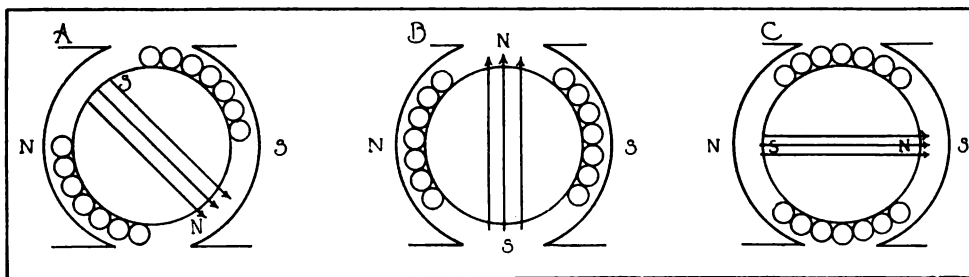


Fig. 1—Magnetic Influence in Motor Action: A, Armature at 45 Degrees Angle to Lines of Force Has Greatest Effectiveness; B, Armature Horizontal to Lines of Force Has Least Power; C, Armature Vertical in Lines of Force Has Greatest Resistance.

the south poles, there being no change in the lines of force. But with the conductor interposed the lines of force passing from the segment forming the north pole to the segment forming the south pole will seek to establish parallelism with the lines of force between the poles of the field magnets. It is practical to describe an electric motor as a construction having a magnetic field, which is produced by field magnets, with conductors in the form of the armature, the armature being so suspended on bearings that it may move when it becomes influenced by the magnetic field.

The creation of a magnetic field within a loop of wire or other conductor, when influenced by an electric current, so that the loop possesses all the qualities of a magnet, is the fundamental principle of dynamos or motors. Each convolution of wire in a winding carrying a given current possesses a definite magneto-motive force, and with the increase of these convolutions the

north to the south poles of the magnet, but when the coil is energized by a current it manifests every quality of any electromagnet, despite its being within a magnetic field. The core of the armature is soft iron laminae, and the core is magnetized by the current circulating in the coil. Without the core the magnetic influence of the current would be weak, but with the core it is greatly intensified, and the lines of force of the coil are at right angles with those flowing between the poles. As the poles of the coil will seek the opposite poles of the original magnet, this causes a movement of the coil or armature in the direction governed by the location of the poles created by the ampere-turns of the horizontal coil and those of the field in which the armature core is suspended.

But, assuming that the coil is in a vertical plane, the magnetic field produced by the coil is at right angles to it, or in a horizontal plane, and these lines of force will unite with those of the field of the magnets, but, if the poles are opposed, the lines of force of the coil will be reduced proportionately to the magneto-motive force. But in this position no motion will be created, as the



lines of force will be parallel to one another.

Between these two extremes another position may be assumed, where the coil and armature are at an angle of 45 degrees with reference to the horizontal and vertical positions assumed, and the magnetic field of the coil is at right angles to the coil. Here the positions of the poles of the coil field are such that movement of the armature must follow, and a strong impulse is manifested, for it is only through moving the coil that the lines of force can establish parallelism with those of the magnetic field. From this statement it will be noted that the slightest variance from the parallel position of the lines of force will impart movement, and it follows that there is a constant tendency of the lines of force of the magnets, which have fixed relation as to influence, and those of the armature coils, to parallel when the latter are in certain positions with regard to the magnetic field.

A more simple manner of expression might be

cording to the equipment, which may include two separate units or a motor-generator.

#### Proper Location of Plugs.

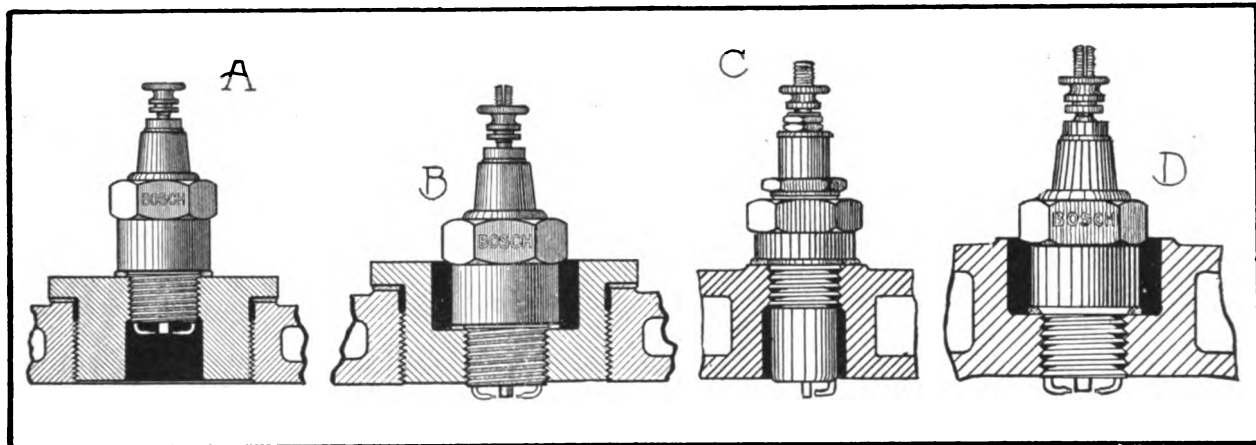
(1666)—In a recent issue of your publication mention was made of the importance of proper location of spark plugs in the cylinders. I would appreciate your explaining why one position or length makes any difference.

G. A. K.

Indianapolis, Ind., Oct. 23.

The point emphasized in the article referred to was proper location of the sparking points of the plug in the combustion chamber. To obtain the greatest efficiency from the mixture the time required for the spread of the flame through it should be as brief as possible. If the gap of the plug, across which the high-tension current jumps, be located in a recess or pocket as indicated at Fig. 2 A, not only will dead gas accumulate about the points, but the combustion of the charge will be much slower than it would were the electrodes located as shown at B.

It will be noted that the construction of the



**Fig. 2—Illustrating Positions of Spark Plugs in Cylinders: A, Poor Location, Creating Pocket for Dead Gas; B, Proper Position, with Points Extending into Combustion Chamber; C, Faulty Design, Exposed to Heat; D, Showing How Same Valve Cap May Be Bored to Obtain Correct Location of Plug—Illustrations Are Reproductions from Bosch News.**

to state that there are permanent magnets that have generally a uniform influence, and a number of electromagnets that may be moved, the fields of the latter having a tendency to reach such positions that their lines of force will be parallel with and in the same direction as those of the former. Consequently, as the current is increased, there is an attraction of the movable electromagnets of the armature coils by the permanent magnets of the motor, proportionate to the current. It may be well to instance that the torque of the armature becomes simply a matter of magnetic field and the current in the armature.

Motor classification is established by the character of the windings and the form of current by which the machines are operated. Those utilized in starting systems of the automobile differ ac-

valve cap at B is such that the electrodes project into the combustion chamber, permitting the spark to come into direct contact with the fresh mixture, and that the flame will spread with maximum rapidity.

Manufacturers of spark plugs have given the matter of location considerable thought during recent years and produce a plug specially designed for the motor in which it is to be used. The shell or base is constructed to project the gap into the combustion chamber, and provision is also made for proper cooling of the material. The last named factor is important and accounts for some troubles experienced by owners who select a plug without particular reference to the valve cap, etc.

If the plug is not properly cooled, or its points



project too far into the combustion chamber, overheating results and the insulation material is more or less affected. As previously pointed out, the efficiency obtained by modern motors is largely due to the makers fitting a spark plug adapted to the cylinder, etc.

#### Fitting a Motor Starter.

(1667)—I wish to install a motor starter, but do not wish to go to a great expense. I have a Cadillac car with a Prest-O-Lite gas tank, also a Bosch dual system magneto. I have looked over several motor starters but could not decide which was the best. I therefore wish to have your opinion regarding the same. Also kindly inform me what solutions to use to make an anti-freezing solution for the radiator. WILLIAM HERZOG, JR.  
Garfield, N. J., Oct. 24.

The selection of a motor starter by the writer would be a matter of personal opinion. There is a large number of practical and successful electric motor starters made and the names and addresses of several manufacturers are given in the Classified Buyers' Guide found elsewhere in this issue. By writing the manufacturer direct, information as to cost and installing can be obtained.

The second question was fully answered in The Automobile Journal for Oct. 25.

#### Valve Timing.

(1668)—As a subscriber of The Automobile Journal I would like to have you inform me which is the best method to time a motor so as to get the most power, and if there is any difference in timing high and low speed engines?  
New York City, Nov. 1.

M. A.

The determination of the exact points at which the intake and exhaust valves of any given motor should open and close is a problem for a designer as there are many factors to be considered.

If reference is made to a motor in service, the original timing, or that of the manufacturer, should be observed, as it is doubtful if the operation of the engine could be improved by altering it. When a motor is designed in a factory, the parts constructed and assembled, it is tested to ascertain the results of the timing planned by the designer. When it leaves the factory, the opening and closing points of the valves obtaining the best results have been determined.

Regarding the second question, the same principles would apply.

#### Leaky Float.

(1669)—I have a car fitted with a Schebler L carburetor which is giving me trouble in flooding. A friend advises me to take out the float, stating that it may be heavy and leak, and shellac it. Any suggestion as to fixing the float will be appreciated. SUBSCRIBER.  
Winsted, Conn., Nov. 4.

If the float be suspected of being heavy, remove it from the carburetor, taking care in the operation not to bend the metal arm to which the cork member is secured. Dry the float very

thoroughly, making sure that any fluid in the pores evaporates. Next, lightly sandpaper it with a fine grade of paper, after which give the cork a couple of coats of thin shellac, allowing the first to dry hard before applying the second. Be sure to fill all crevices and pores of the cork with shellac.

#### Leaky Petcock.

(1670)—How can a leaky petcock in the gasoline system be cured? I have a petcock under my tank which is moved by a rod extending to the outside of the frame so that the gasoline can be shut off. The valve leaks, although I have taken up on the spring part.

CONSTANT READER.

Elkhart, Ind., Nov. 3.

Disassemble the petcock and note the condition of the seat of the valve. It is possible that it requires grinding and the work may be accomplished by taking a fine abrasive, ground glass for example, and grinding in the valve proper, much in the same manner as the valves of a motor are ground.

#### Piston Displacements.

(1671)—This is to inform you that I like The Automobile Journal very much. There is much valuable information in it, and I always look forward to the next issue. I wish you would inform me how to figure the piston displacement of a motor, also how the horsepower rating, S. A. E., is obtained. I own a Marion car, the cylinders of which are four by five. C. R. JACKSON.

Stark, Stark Co., Ill., Oct. 31.

To ascertain the piston displacement of a four-cylinder motor, the Marion, for example, square the bore and multiply the product by the stroke. Multiply the result by .7854, which will give the piston displacement of one cylinder. Multiply the product by four, which will give the piston displacement in cubic inches of the four cylinders. For example:

$$4 \times 4 = 16 \times 5 = 80 \times .7854 = 62.8320 \times 4 = 251.338.$$

The S. A. E. horsepower formula is assumed on a piston speed of 1000 feet and is as follows: Square of bore x number of cylinders ÷ 2.5. For example: The Marion motor has a four-inch bore and five-inch stroke, consequently  $4 \times 4 = 16 \times 4$  cylinders  $= 64 \div 2.5 = 25.6$ . The formula disregards the stroke entirely.

Owners of Ford cars in many of the cities and towns of this country have organized Ford societies for the purpose of establishing social relations, arranging tours and particularly for promoting Ford fellowship. The growth of these societies has been very great and there is now some talk of forming a national society with a club in every town. With every Ford owner eligible to such a society it could start with an approximate membership of 300,000.



## WITH THE CYCLECAR MANUFACTURERS.

### Recent Developments in the Newest Branch of the Industry---Imp Has Larger Motor---Detroit Speedster---Four-Cylinder Engine on Pacific Coast.

JUDGING from the statements being issued by cyclecar companies, many of these concerns have progressed so far in their manufacturing plans that the motoring public may expect to hear much concerning road tests, etc., during the next few weeks. Boston was considerably interested recently in a report that one maker was about to undertake a transcontinental tour from that city to San Francisco. Careful investigation of the rumor seemed to indicate, however, that this announcement was a trifle premature.

Several road tests of more or less length have been undertaken in the Middle West, and so far as the facts have become known, there appears to be every reason for believing that the little machines stood up well, despite the road conditions. One of these was a Zip, made by the recently organized Zip Cyclecar Company, Davenport, Ia. The run was from Davenport to Iowa City, a distance of some 57 miles, and the roads were frozen in ruts after three days of rain. Full constructional details concerning the Zip cyclecar have not been made public, but it may be stated that it is a two-passenger car, with seats side by side, belt driven and equipped with a two-cylinder V type motor.

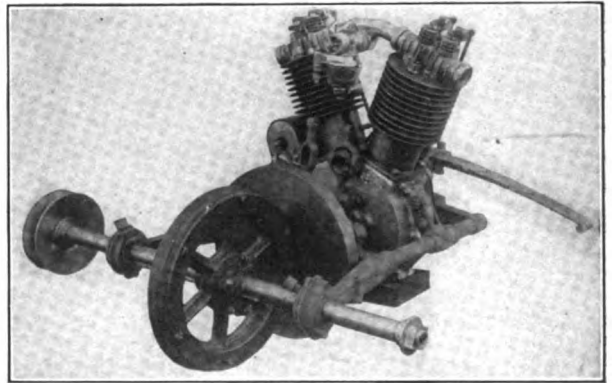
Another new concern to announce the production of a cyclecar is the Dudley Tool Company, Menominee, Mich. The machine will be known as the Dudley, and will be fitted with a two-cylinder, air-cooled, V type motor rated at 10 horsepower. It also will have a planetary transmission with final drive by belt. The seats will be semi-tandem, the wheelbase 96 inches, tread 36 and weight about 400 pounds. It is stated that a test car already is on the road.

#### NEW MOTOR FOR IMP.

The Imp Cyclecar Company, Auburn, Ind., has been shipping machines in limited number for the past six weeks or two months, and expects to be able to increase production very materially in the near future. The little car has been given a number of road tests throughout the Middle West, one of them being a cross country run from Auburn to Milwaukee and return. As a result of these trials it was demonstrated to the satisfaction of the designer, W. H. Mc-

Intyre, who is well known throughout the industry, because of his connection with the W. H. McIntyre Company of Auburn, maker of McIntyre pleasure cars and business wagons, the desirability of changing the size of the motor somewhat.

The new power plant is shown in an accompanying illustration, and it will be noted that the two-cylinder, air-cooled design is retained. The exact dimensions of the cylinders have not been made public, but it is rated by the maker at 12-14 horsepower, as against 10 for the motor first utilized. Mr. McIntyre explains that he has found additional power advisable in ascending hills and in contending with road conditions where the latter cannot be regarded as ideal in every respect. The illustration also presents the method



The New 12-14 Horsepower Imp Motor.

of suspension, the friction transmission and the upper leaf of the front spring.

As is more or less well known, the conventional friction transmission affords an unlimited number of speed ratios, either forward or reverse, the variations being obtained by moving the periphery of the driven member across the face of the driving disc. Those who favor the friction transmission hold that the possibility of securing such variations is of decided advantage.

Consideration of the friction transmission as applied to cyclecar construction in America will reveal the fact that in nearly every instance the designer has taken steps to limit the number of speed ratios, obtaining results very much like that of the gear transmission, through the fitting of some form of stop. In explanation, it may be



stated that the several positions of the sliding disc, with reference to the driving member, have been determined after exhaustive tests as representing those in which the best service can be expected, taking into consideration the size of the motor and other equally important factors.

In the Imp, a special alloy disc is attached to the motor crankshaft, as shown, and the sliding member, or follower, as it is termed, comprises a detachable paper friction ring clamped between two metal flanges. A lever is fulcrumed above the centre line of the crankshaft and operates against a trunnion housing which contains Radio thrust bearings. Two springs anchored on a flexible arm on the motor are attached to the upper end of the lever, which is controlled by pedal, and the spring tension is increased or diminished by a cam mounted on the shifting rod and pressing against a corresponding cam on the flexible arm, while the follower is moved across the mo-

Cale; secretary and treasurer, F. L. Hall, also secretary and treasurer of the Gabriel Trussed Concrete Steel Company; chief designer, Ernest Weigold, for six years with the designing department of the Herreshoff Motor Company.

The little Detroit speedster is equipped with a four-cylinder, water-cooled motor, with bore of 2.75 inches and stroke of four, giving a rating of 12.1 horsepower under the S. A. E. formula. Cooling is by thermo-syphon, and lubrication is by splash with gravity feed. Ignition is by magneto and the carburetor is of the firm's own make.

The transmission is of the selective type, affording two speeds forward and reverse. The clutch is a disc. Drive is by shaft. The frame is of channel section suspended on long, flexible, semi-elliptic springs both front and rear. The front axle is an I beam, with patented spindle designed to make steering more efficient and easy to control. The rear axle also is of special design.

Brakes are internal expanding.

A departure from the usual cyclecar design in this country is noted in the wheels, which are of wood, artillery type, and are fitted with 28 by three-inch tires. The wheelbase is 92 inches, and the tread, 44. The weight is given as 850 pounds.

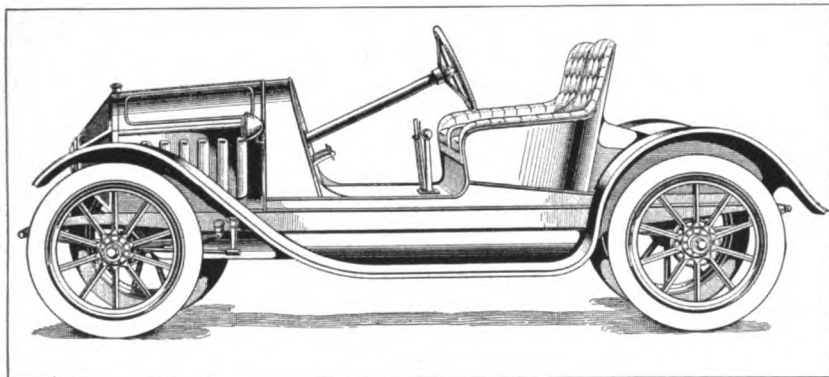
The body is of metal, of the open speedster type, with straight dash containing the fuel tank, pointed radiator, streamline fenders, etc. The two passengers are seated side by side,

with the driver at the left, with centre control levers. The sloping rear deck is portable, making this portion of the chassis available for business purposes if desired.

It is stated that factory space and a machine shop have been secured in the eastern part of the city, and that the production of the first few cars is now under way. According to the company, the demand for cyclecars is reflected in the number of agents throughout the country which have contracted for machines, and C. G. Bleasdale, for some years Maxwell agent in Cleveland, O., is said to have purchased a large block of stock in the company and to have contracted for 1000 cars to be delivered as soon as production will permit.

#### PACIFIC FOUR-CYLINDER MOTOR.

In anticipation of a demand for more power and speed, it is understood that several concerns throughout the country are considering the ad-



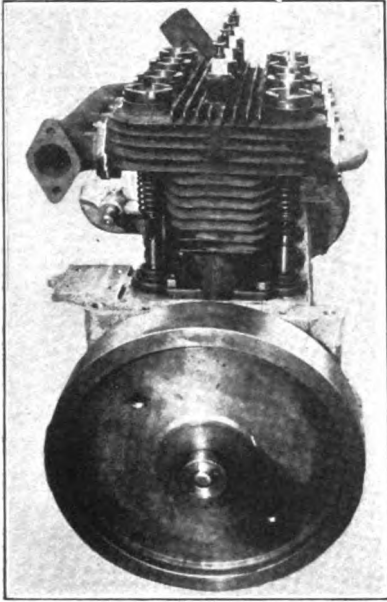
General View of the Little Detroit Speedster Model.

tor disc. This action decreases the pressure between the friction wheels as the speed of the follower increases and in inverse proportions exactly, or vice versa, assuming that the motor is running at a fixed speed. Each speed is locked when set by the device connecting the shifting rod with the pedal.

#### LITTLE DETROIT SPEEDSTER.

The Detroit Cyclecar Company, 504-508 Elks' Temple building, Detroit, incorporated recently under the laws of Michigan, with capital of \$250,000, is announcing the little Detroit speedster. The officers elected include the following: President, A. R. Thomas, formerly with the United States Motor Company and the Studebaker Corporation; vice president and general sales manager, B. C. Bradford, formerly with the United States Motor Company and the Hudson Motor Car Company; second vice president, Philip H.





**End View of Pacific Four-Cylinder Motor.**

visability of producing four-cylinder motors for cyclecar use. It will be admitted that much experimentation must result before designers can make definite decision with respect to the size of the power plant, and while the twin-cylinder motor has proven entirely adequate for motorcycles, there exists a feeling on the

part of some engineers that many cyclecars will eventually carry four-cylinder engines.

The Pacific Mechanical Company, 5410 Normandie avenue, Los Angeles, Cal., maker of Pacific motors, claims to be the first to produce a four-cylinder model designed especially for cyclecars. It maintains that its past experience in the production of power plants for automobiles, motor trucks and aeroplanes, places it in an enviable position, and that the new motor embodies features which will make a distinct appeal to those who are entering the new field.

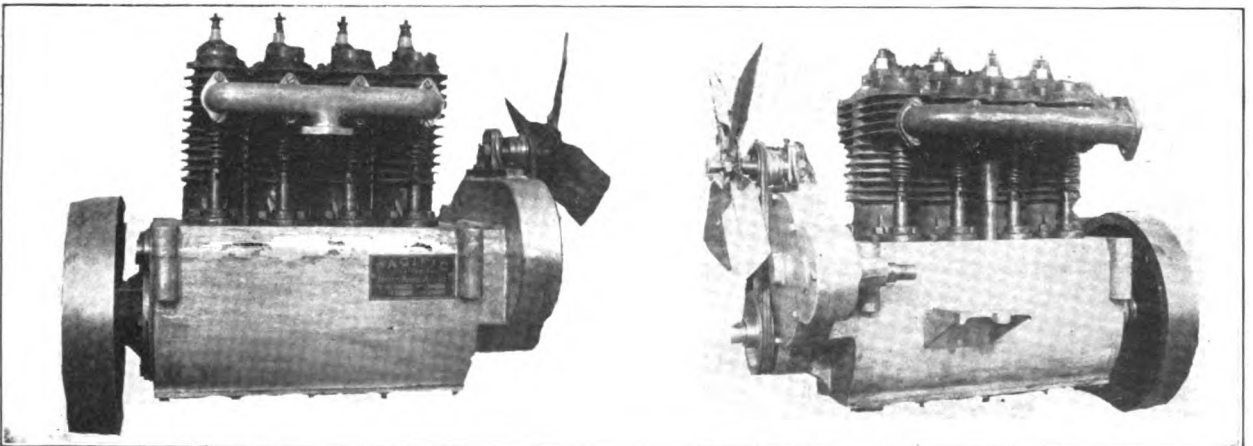
The four cylinders have bore of 2.5 inches and stroke of 3.5, giving a rating of exactly 10 horsepower under the S. A. E. formula. The weight is 100 pounds. The valve diameter is 1.25

inches. The crankshaft is 1.25 inches in diameter, and is of the two-bearing construction, that at the front being three inches long and that at the rear 3.5. Each connecting rod bearing is 1.75 inches long and 1.25 inches in diameter. The flywheel is 11 inches in diameter and has a rim 2.125 inches in width.

The crankcase is of aluminum, scraped and polished; connecting rods and crankshaft of steel, and the cylinders, pistons and rings of fine grade of gray iron. Air cooling has been adopted to minimize weight and to save the expense of the radiator, hose and pump. The fan is 12 inches in diameter and is driven from the crankshaft.

Special attention is directed to the method of mounting the motor in the car, it being maintained that no matter what construction is contemplated by the designer, this method of hanging will adapt itself more readily than any other standard base construction so far designed. It is explained that it may be hung underneath two angle pieces and held by four bolts, .4375 inch in diameter at each corner of the crankcase, or, as has been done by one maker, the angle irons may be run underneath the motor and four short pieces of steel tubing used for uprights, which bear under the lugs on the crankcase. It is held that it makes no difference whether a sub-frame, main frame or underslung type of construction is adopted, the method of hanging will lend itself readily.

It is added that the flywheel can be machined for any type of drive. The magneto bracket cast on the crankcase is of standard Bosch dimensions, and a .75-inch carburetor, with standard flange, is used. The cylinder heads are tapped for the regular motorcycle spark plugs, and each cylinder is cast separately and the cost of replacement will be a very small amount.



**Inlet and Exhaust Sides of the Four-Cylinder Cyclecar Motor Produced by the Pacific Mechanical Company.**





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**THE AUTOMOBILE INDUSTRY.**

For some time past there has been a feeling in certain quarters that the automobile industry has reached a point where there was soon to be a reaction in which those engaged in the production of pleasure cars, particularly, were to experience extreme financial and other reverses. Those who have held this view profess to see verification of their opinion in the present situation with respect to some few individual companies.

It is important to consider the position which the passenger automobile occupies in the economic life of this country. In the first place, it is an exceedingly practical vehicle, which finds a decided field of usefulness in business activities. The term pleasure car is largely a misnomer in its present application. If it were to make its

plea for existence solely on this score, the time might come when it would be superseded by some other form of transportation, although this does not now seem probable. But, since it must be acknowledged that it has a business value, entirely aside from its contribution to recreation, the motor car must be regarded as having a permanency that can be but little affected by the failure of any one or several manufacturers.

While the automobile industry ranks well toward the head of the list of American industrial activities, it is the youngest, and progress has been rapid. Careful study of the situation cannot help but indicate that the question is one of securing the necessary financial aid at the exact time it is needed, for it must be admitted that much capital is required to place an industry of such recent origin upon the footing it now enjoys in this country.

Those who are best able to judge of the possibilities, foresee greater stability in the future. The demand undoubtedly will reach a certain level, which in itself will enable the manufacturer to so regulate production as to insure the proper balancing of his business—something which manufacturers in all lines have been trying to do with more or less success during the past few years. In any event, there is no reason for suggesting that the automobile industry is on the wane, but, on the contrary, every reason for believing that it is about to enter upon a period of financial and business stability which cannot help but make for success in every respect.

That the use of motor fire fighting apparatus provides for efficiency is not doubted. The fire department budget in New York City for the coming year is over \$1,500,000 less than for 1913, although it provides for the opening and manning of 15 new fire stations. Commissioner Johnson explains that this represents the saving effected by the introduction of motorized equipment to replace horses. This would appear to leave but little room for doubting its economy as well.

The demand of modern times is for modern transportation methods. If existing bridges and roads are not able to withstand the new traffic conditions, it would appear the better part of wisdom to follow the example set by Rhode Island in constructing a new bridge capable of carrying the heaviest truck loaded to capacity.



## NEW EMPIRE HAS MANY REFINEMENTS.

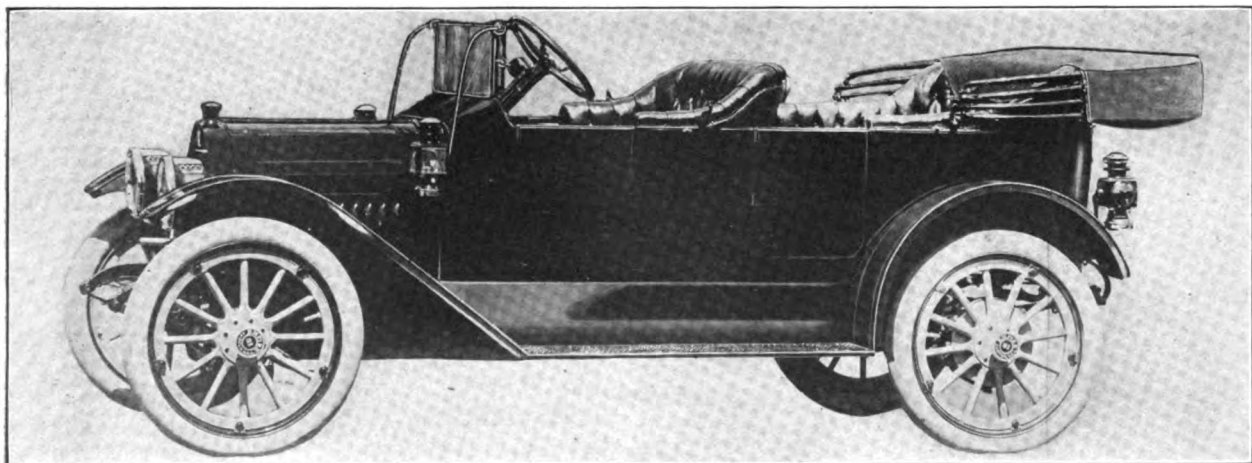
**C**ONFORMING to its policy of building but one chassis and fitting to it a five-passenger touring body, the Empire Automobile Company, Indianapolis, Ind., announces but one model for the season of 1914. The new car is an enlarged edition of the former machine and while there are no radical changes in the basic principles and design, many minor improvements have been made, and the selling price has been reduced \$50. Increased production has enabled the company to manufacture a larger and a higher grade car than formerly and the fittings, equipment, etc., are in keeping with the new design.

In developing the model 31 the company has concentrated its efforts in the production of a light weight, durable vehicle, capable of being

stroke 4.5, placing it in the long stroke class. The crankshaft is a drop forging of high carbon steel, 1.75 inches in diameter and supported in three large bearings, these being three, four and five inches in length, respectively, from front to rear. Other bearings are large and white brass is utilized throughout. All components of the motor are readily accessible for inspection or adjustment.

The camshaft is of high carbon steel, mounted in four bearings, and the cams are integral. Fibre inserts are utilized on the tappets and all valve mechanism is enclosed. Large and easily removed inspection plates are a feature of the motor.

Carburetion is by a model H Holley located



**New Series Model 31 Empire Having Longer Wheelbase Than Former Design and Including Many Refinements Making for Comfort and Convenience in Operation.**

maintained at a minimum of cost and having sufficient power to meet all requirements of service. Simplicity is noticeable of the chassis, the wheelbase of which has been increased to 110 inches, and throughout the proportions of the components are well balanced.

### **Three-Point Suspension.**

The three-point suspension of the power plant, clutch and transmission is continued, it having proven highly efficient in service, particularly under the severe test accorded in the Indiana-Pacific tour. The method of suspension is made clear in an accompanying illustration and it will be noted two of the points are anchored to the frame by means of a substantial cross member.

The L head type of motor with cylinders cast in pairs is retained, the bore being 3.75 inches,

on the left hand side of the motor and a special air device, adjusted from the dash, is provided for starting in cold weather. Vaporization is aided by the conventional hot air taken from the exhaust manifold and led to the carburetor through a flexible tube.

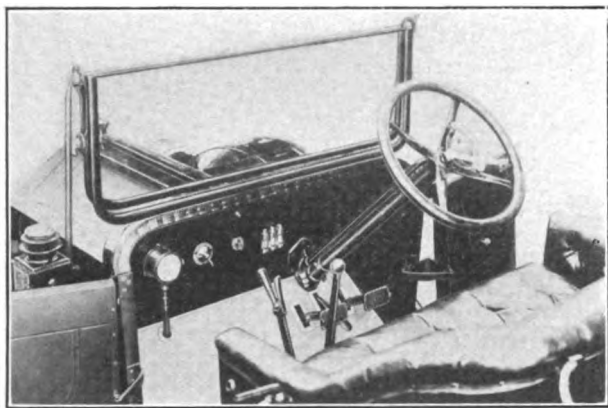
### **Fixed Spark Ignition.**

A true high-tension Eisemann magneto with fixed spark is employed, the company holding that it is best adapted to all conditions of service, simplifying the control and making for efficiency at all motor speeds.

Lubrication is a combined splash and pressure feed, the oil being taken from the reservoir in the crankcase by a positively driven pump, forced to a sight feed on the dash, thence to the three main bearings, whence it overflows to compartments in the crankcase. The ends of the connecting rod



dip into the oil, splashing it to the working parts. A constant level is maintained, all surplus lubricant flowing to the sump, where it is filtered be-



**Showing the Simplicity and Convenience of Control Members, Comfortable Upholstery and Large Steering Wheel.**

fore again being circulated by the pump. The oil capacity is 1.5 gallons.

Cooling is by the thermo-syphon system, the cooled fluid entering the cylinders at the right of the motor, passing upward through the water jackets and around the exhaust valve, thence to the outlet manifold and to the radiator. Both manifolds are of polished aluminum and are 1.75 inches inside diameter. Cooling is further aided by a ball bearing, belt driven, adjustable fan. The radiator is large, assuring ample cooling in high altitudes. The hood is provided with ventilators.

#### **Components Accessible.**

The clutch is of the disc and ring type, with two discs faced with Raybestos and a steel member, each nine inches in diameter, these operating in oil. Provision is made for inspection and adjustment, a large hand hole being fitted to the top of the housing, which is accessible by raising the floor-board in the driver's compartment.

The transmission is of the selective type, providing the three conventional forward speeds and a reverse and the gears are large, with .875-inch faces. The supply of lubricant may be renewed easily, a large plate being fitted so as to be very accessible.

But one universal joint is employed, this being mounted at the rear of the transmission housing, and the drive is straight, by a large sized steel shaft

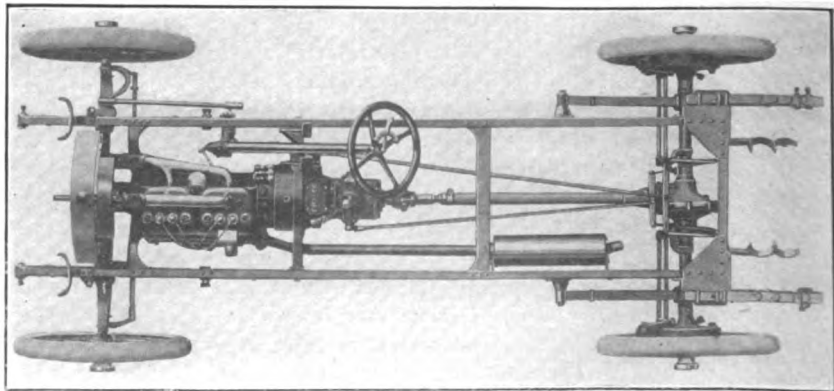
enclosed in a tube reinforced at the universal joint end, where provision is made for adjustment. The shaft is squared at this end, a construction facilitating the removal of the rear system, as by displacing the axle spring clips and detaching the brake rods, the axle may be taken out easily.

#### **Well Constructed Rear Axle.**

The rear construction is of the semi-floating Weston-Mott type, the axle of a high grade steel, and high duty Hyatt roller bearings are utilized throughout. A noticeable feature of the rear axle is the utilization of a 3.5-inch sleeve bearing member, which is hardened and ground. The axle carries a hardened sleeve and the rollers bear upon this member.

Special attention has been paid to the springs, each leaf being ground and polished before assembling. The rear springs are three-quarter scroll elliptic, having six and eight leaves, 1.75 inches wide. They are provided with grease cups for lubrication of the shackle bolts. The lower leaves of the upper springs are curved and carried backward to a point approximately over the rubber shock absorbing bumper, which is secured to the lower spring. The front springs are semi-elliptic, 1.75 inches wide, and the six leaves are secured to the axle by substantial clips. The front axle is a Weston-Mott, of the I beam section type, and the steering arms and knuckles are drop forgings.

The frame is very substantial. It is of pressed steel, .1562 inch thick and has a depth of channel of 3.562 inches. It has a kick-up at the rear, providing a low centre of gravity, and the rear cross member is reinforced by two large gusset plates with flanges securely riveted as illustrated.



**The Empire Chassis Is Noticeable for Simplicity and Accessibility of Components, and Throughout the Proportions Are Well Balanced.**

The size of the brakes provides a large factor of safety. The service members are of the external contracting type, operating on 12-inch drums, and



have a two-inch face. The emergency members are of the internal expanding design, operated by the conventional hand lever at the left of the driver. Both sets are fitted with equalizers mounted over the differential.

#### **Large Sized Tires.**

The wheels are of the artillery type with second growth hickory spokes and have large hubs. They are fitted with Baker demountable rims, with one extra rim as standard equipment, and provision is made for the carrying of two extra shoes at the rear, the tire holder being anchored to the rear cross member. Tires are 32 by 3.5 inches, front and rear.

The driver is placed at the right with centre control. The gearshift lever is of the cane handle type, and a feature of the control is the short movement required to effect the different changes of speed. The emergency brake lever is also mounted on the transmission housing. The right pedal actuates the clutch, the left the service brake. The accelerator is located between these members. The gasoline tank has a capacity of 15 gallons with two gallons held in reserve. Feed to the carburetor is by gravity.

The body is of aluminoid steel, with graceful flowing lines, and the cowl dash harmonizes with the design. The door ledges are upholstered, and the upholstery is deep and luxurious, a high grade hand buffed leather being utilized. The cushions are wide and the seats deep, the rear seat easily accommodating three persons. There is ample room in the tonneau between the back of the front seat and rear cushion, also between the dash and front seats.

The hood, fenders, skirt and aprons are finished in black baked enamel, and all metal trimmings are nickel plated. The running gear is a French gray with the body finished in Royal Empire blue. The finish is first class in every respect.

#### **Complete Equipment.**

The car is fully equipped. The top is a mohair with slip cover, and curtains operated from the inside are standard. The windshield is of the clear vision type. The speedometer is a Stewart, mounted on the dash with the magneto switch, carburetor control and oil sight feeds. The gas headlights and oil side and tail lamps are black enamel with nickel trimmings. The Prest-O-Lite tank is encased in a black enamelled cover. The balance of the equipment includes: Rubber bumpers, robe and foot rails, jack, pump, tire repair kit, tools, etc. The Empire model 31 is designed for a light weight family car capable of being maintained at a minimum of expense and

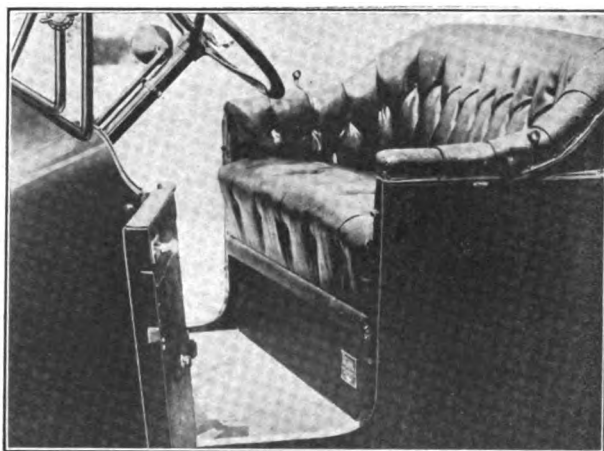
to give efficient service under all conditions of operation.

#### **MILLER AT ATLANTA SHOW.**

#### **Pioneer Accessory House Is the Only Jobber Exhibiting at Southern Display.**

According to advance information from Atlanta, Ga., the only accessory jobber to make display at the Atlanta automobile show, which opened Nov. 8, to continue until Nov. 15, is Chas. E. Miller. The main office of this pioneer house is at 97-103 Reade street, New York City, but for some years it has maintained an important branch in the South at 259 Peachtree street, which may be regarded as Atlanta's automobile row.

In keeping with its policy in connection with



**Ample Room Is Provided in the Driver's Compartment of the Empire Car.**

all local shows in the 13 cities, in nine different states, where the Miller branches are located, the display in Atlanta comprises a full line of goods handled by this well known manufacturer, jobber, importer and exporter. Particular attention is being drawn this year to a number of Miller specialties.

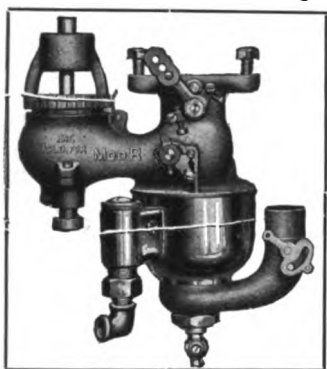
Chief among these may be mentioned the Pan-American lubricants, comprising polish, oils, transmission lubricant, tire lubricant, etc. Other goods having a prominent place in the display are: Miller tire saver, Miller cementless patches, Miller jack, Miller eight-day clock, Miller mica and Miller porcelain spark plugs, and Brampton roller chains.

It will be understood that similar exhibits will be made in all the cities where the Miller branch stores are located.



## SCHEBLER BRINGS OUT A NEW CARBURETOR.

**W**HHEELER & Schebler, Indianapolis, Ind., maker of the Schebler carburetor, has brought out a new design termed the model R, a



**Model R Schebler Carburetor.**

single jet construction of the concentric venturi type, differing from earlier models. The most pronounced variance is the lift of the needle valve actuated by the auxiliary air valve, a lever connecting the latter and the needle. The principle of former models, that of raising the needle and proportioning the fuel emerging from the jet to the air, is continued, but the well known cam and roller has been replaced by the lever arrangement, as will be noted by the sectional drawing presented herewith.

The fuel enters the float chamber at R in the conventional manner, the supply being regulated by the usual needle valve, rising to a level of about .0625 inch below the jet opening J. The gasoline passes to the central jet passage through a series of holes arranged around the bottom of the chamber. The primary air passage is through the centre of the carburetor by the way of the venturi V around the jet and the air intake pipe X is arranged for using the conventional flexible tubing conveying heated air. It is also provided with a strangling valve for enriching the mixture for starting.

The proper mixture at low speed is obtained by the usual needle valve E, which projects downward into the jet, but the method of controlling this pin differs from former practise. Adjustment is secured by means of a Bowden cable W from the steering column, the wire being connected with a bell crank lever B, which raises or lowers the needle as desired when the cable is rotated. The lever on the steering column is so attached that when in a central position the mixture is correct for low speed. The operating position is when the boss of the lever is against the stop. The lever should then register with the words "Lean" or "Air". This permits of the driver altering the position of the needle valve to meet atmospheric changes, and to enrich the mixture for starting when the motor is cold.

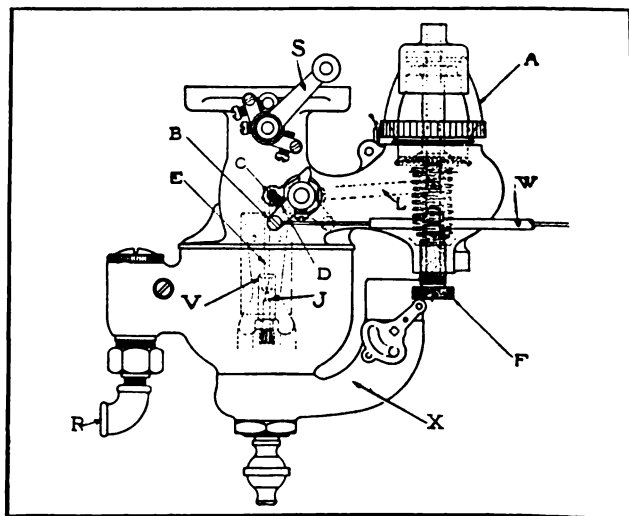
The proportions of fuel and air at high speeds are secured automatically as with former models,

but in the new design the raising of the needle is by the air valve as previously explained. As the speed of the motor increases the suction of the piston acts against the spring, compressing this and moving the lever L downward. The needle E is consequently raised and to a degree determined at the factory. The entire operation is automatic, and during the movement of the needle the lever controlled by the Bowden cable is inactive insofar as it affects the position of the needle.

Two adjustments are provided, the low speed needle, which is obtained by turning the air cap valve member A, and the high by regulating the tension of the auxiliary air valve spring. In setting the carburetor the lever B is connected with the Bowden cable in such manner that when the boss D of the lever B is against the stop C the lever on the steering column control will register "Lean" or "Air".

Turning the air cap A to the right augments the supply of fuel; in the opposite direction, decreases the amount or makes for a leaner mixture, in that the needle valve is lowered. For starting in cold weather, the dash lever is moved toward "Rich", which lifts the needle out of the nozzle, and with the choke valve in the air intake X closed, a rich mixture is obtained. Upon the motor becoming warm the control lever is placed at "Air" or "Lean" as best meets requirements.

The new carburetor is made in four sizes, namely: One inch, 1.25, 1.5 and 1.75. It is de-



**New Design Schebler Carburetor, the Feature of Which Is Control of Needle Valve by Auxiliary Air Valve.**

signed for service on four and six-cylinder motors and may be utilized either with pressure or gravity feed.



## IMPROVED ROADS AND MOTORING LAWS.

### United States Good Roads Association Offers Still Another Plan for Securing Federal Funds--New York State May Reorganize Highways Department.

**S**TILL another good roads organization of national proportions is making its position felt, this being the United States Good Roads Association, organized as the result of a meeting in Birmingham, Ala., April 24. The first convention has been called in St. Louis, Nov. 10-15, the announcement stating that "every advocate of good roads is invited to be present and take an active part in the work to be begun at St. Louis and continued until results are secured". In his call, President John H. Bankhead sets forth the object of the association as follows:

The controlling purpose of the association is to secure federal aid in the construction of an adequate system of highways throughout the United States. The association desires to extend its activity toward the passage of state laws in harmony with federal aid legislation. It does not hope to amalgamate all good roads organizations into one grand body, but most earnestly desires their co-operation in one great effort to accomplish the ends sought by all, namely: Appropriate legislation looking to the building and maintenance of highways throughout the United States, and to secure appropriations from the federal treasury to effectuate such legislation.

The methods by which the United States Good Roads Association hopes to attain its objects appear to be along lines indicated in a bill introduced into the United States Senate by Senator Thompson of Alabama, at the request of Mr. Bankhead, in September. Briefly summarized this bill provides for the following:

The creation of a national bureau of highways, under the joint direction of the Secretary of Agriculture and the Postmaster-General, through a commissioner of public highways appointed by the President at a salary of \$10,000 a year and travelling expenses. The commissioner shall have power to employ engineering and such other assistance as needed.

Upon application to this commissioner, made by the state legislature, or such officer as shall be designated by the legislature, governor, etc., he shall satisfy himself that the post road or rural delivery route under consideration should be improved and that the state or local authorities have available, in cash or its equivalent in labor, half of the expense exceeding \$5000. No work shall be undertaken without advertising for bids, which shall be opened in public, and contracts shall be awarded jointly by the commissioner and state or local authorities. All questions as to location, methods of construction and maintenance shall be determined by the commissioner.

The commissioner and the state or local authorities shall have joint supervision over the work of construction and maintenance, so long as the national government shall continue to expend money thereon. One-half of the cost of such work shall be paid by the treasurer of the United States, upon warrants to the commissioner, which shall be charged to the national highway fund allotted to the said state.

The sum of \$25,000,000 shall be appropriated, which, less salaries and expenses, shall be apportioned among the several states, as follows: One-half in the ratio to

which the population of each state bears to the total population of the United States, and one-half in the ratio which the mileage of star routes and rural delivery routes in each state shall bear to the total mileage of such routes in the United States—provided that the apportionment to no state shall be less than \$100,000.

It is further provided that the commissioner shall give first consideration to such highways as will form a part of a proper state system of highways, and with a view to connections for such systems into an interstate or national system of highways between principal points.

The programme for the convention is an unusually full one, it being explained that short speeches will be the rule, or, as the call expresses it: "No long paper, but general short, crisp debates will be the feature of the convention. It will be practical and not theoretical. Less rhetoric and better results is the object of the meeting".

### CHICAGO'S FENDER ORDINANCE.

#### Full Text of Regulation Which Requires Truck Owners to Equip Their Cars.

Considerable interest has developed concerning the amendment to the Chicago traffic code of 1911, which provides for the equipment of all motor trucks and delivery wagons in that city with fenders, brief particulars of which were announced recently. The full text of the new regulation follows:

Section 2650½—It shall be unlawful for any person, firm or corporation to use and operate within the city of Chicago any motor car or truck for the purpose of conveying therein bundles, parcels, baggage or wares, merchandise or other similar articles unless said motor car or truck is provided with a fender, as in the case of street cars operated and used within said city, of such design as may be approved by the board of inspectors of public vehicles.

Section 2—This ordinance shall be in full force and effect in 90 days from and after its passage, approval and publication.

### NO FURTHER CONFUSION.

#### Lincoln Highway Association of Colorado Changes Name of Its Route.

As was pointed out in a recent article in these columns concerning the Lincoln highway of Colorado, there was danger of confusion because of the similarity of this name with that of the Lincoln Highway Association, a national organization with headquarters in Detroit. The larger



body has adopted a route across the country from New York to San Francisco, a portion of which traverses Colorado, but over an altogether different course than that selected by the Lincoln Highway Association of Colorado.

At a special meeting of the Colorado association, held in Colorado Springs, Oct. 23, it was unanimously decided to continue the present organization with name unchanged, but to change the name of the section of the transcontinental route under improvement by this body to the Pikes Peak route. It is explained that there is no desire on the part of the Colorado association to conflict in any way with the plans of the Detroit organization for the promotion of the Lincoln memorial highway, as the latter's transcontinental route is known.

### SCIENTIFIC ROAD BUILDING.

#### Department of Agriculture Stands Ready to Aid Communities and Individuals.

Announcement is made by the office of public roads, Department of Agriculture, that such advancement has been made in problems connected with road construction that efforts are now being directed toward teaching the country that the expenditure of large sums of money on certain types of roads may result almost in a total waste. In other words, attention is being directed to the fact that a road built of materials which would be ideal in one locality may not serve the purpose at all elsewhere and the money expended may bring scarcely any result in reducing the cost of haulage or making it easier for the farmer to get to the shipping point with his crops.

In order to aid farmers who want to build their own roads and to assist various communities that desire to improve the highways nearby, the office of public roads has employed experts to test all materials and study their usefulness on roads subjected to certain traffic conditions. The office also is acting in an advisory capacity to many states and counties, giving what is termed a most practical form of national aid. Director Logan Waller Page, in discussing the new scientific movement in road improvement, says:

There are two ways in which the engineer may avail himself of the information necessary to a proper selection of road material. The first and only certain one is to make an actual service test of the material under observation, and under the same conditions of traffic and climate to which the proposed road will be subjected. This method, however, is impractical except in certain rare instances, due to the time which must elapse before definite results can be obtained.

The second method is, by means of short time laboratory tests, to approximate as nearly as possible the destructive agents to which the material will be subjected

on the road, supplementing the knowledge thus gained by a study of the results already obtained in practice on material of a similar nature.

The office of public roads constantly uses both methods. At Chevy Chase, near Washington, D. C., a model road has been built in sections made of different materials, while in the laboratory of the office tests are constantly being made with materials under certain traffic conditions.

### TO EFFECT LARGE SAVING.

#### Reorganization Plan for New York State to Reduce Expense Materially.

William DeHertburn Washington, George C. Diehl and Harold Parker, acting as a special board of consulting engineers, appointed to perfect a plan for the reorganization of the highways department of New York State, have reported to John N. Carlisle, commissioner of highways, a scheme by which they suggest it is possible to effect a saving of \$500,000 a year. It is further contended that the new arrangement would make for greater efficiency and would prove in every way more sensible and satisfactory. The plan may be outlined briefly as follows:

To place highway construction, maintenance and the supervision of town highways under the direction of a chief engineer, working under the commissioner as the administrative and executive head of the department. The chief engineer would have two deputies, special residences and clerks to handle the office work and any technical investigations that might be necessary. The deputies would be in charge of a specified portion of the state, the division to be made so as to place approximately the same amount of work on each.

The state would be divided into nine divisions, each in charge of a division engineer, who would have in his office a resident engineer competent to act in his absence and to have special charge of surveys, maps, designs, estimates, payments on contracts, etc. He would also have a chief clerk to care for correspondence, files, preparation of vouchers and similar work.

In the field work, each division would be divided into approximately seven sections, with an assistant engineer in charge of each. Under the direction of each division engineer for the maintenance work there would be three gangs, with automobile trucks, each gang to maintain approximately 150 miles of completed state and county highways. This would cut down the number of patrolmen to a large extent and substitute in their place a system of maintaining highway by the section gang. It is in this last named respect that it is estimated that the greatest saving would be effected.

The State of Rhode Island has just completed a new bridge in the village of Shannock, which was designed and constructed to carry the heaviest type of motor truck manufactured, loaded to its maximum capacity. The work was done under the charge of Inspector Wendell Phillips of Wyoming, and it is believed that this is the first attempt, in New England at least, to meet modern traffic conditions by the erection of a bridge of this character.



## SOLID TIRES FOR ELECTRIC TRUCKS.

The Essential Qualities Sought in Designing and Constructing Tire Equipment for All Methods of Vehicle Propulsion---How Efficiency Tests Are Made.

(By A. H. Leavitt, M. E.\*)

**I**N GAS truck practise little is required of the solid truck tire except it be of sufficient resilience to insure protection to the truck mechanism, of positive application to insure permanence, and of a quality to give maximum mileage service. The solid tire for electric truck service, however, presents a different problem to the manufacturer, as not only resilience and permanent application are required, but in addition the compound must be such as to reduce the current consumption to the minimum, at the same time increasing the speed of the truck to the maximum.

### Problem of Tire Manufacturers.

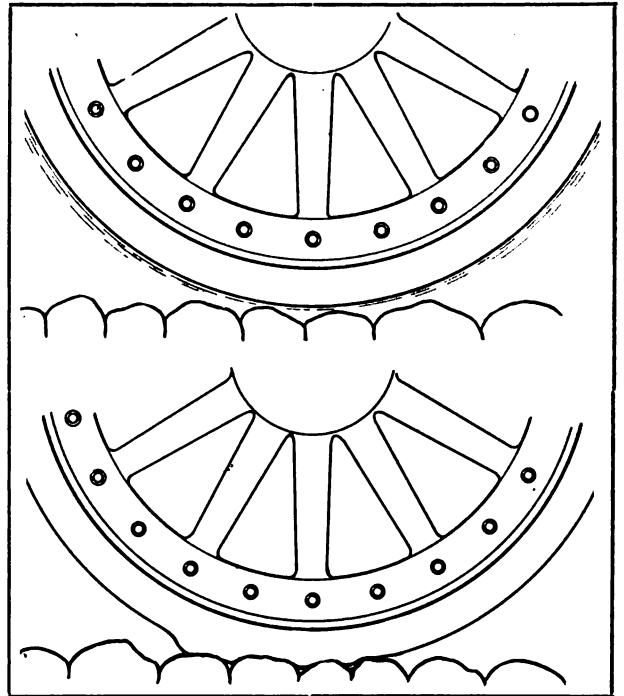
To the uninitiated this problem may appear of little consequence and the general impression of the efficient solid tire is one composed of either a very hard or very soft compound. The highest current efficiency is obtainable by equipping a truck with steel wheels and operating it upon a steel track; however, a rubber tire of excessively hard compound has been found to be efficient only under ideal road conditions such as asphalt or good hard macadam surfaces. On brick, cobble stones or rough roads generally, the vibration is extremely detrimental to the truck mechanism and the efficiency falls below that of a more resilient tire due to the slip of the wheels during the period of vibration. On the other hand, a tire built from an excessively soft compound presents such a large area of contact with the road when under load that there is a holding back or "drag", which materially reduces the speed and increases the ampere draw.

Knowing that too hard or too soft a tire will not be of the proper efficiency to meet the requirements for electric truck service, the tire manufacturer must develop a compound between these extremes, combining high current efficiency and speed. To determine the most efficient solid tire it must be taken from the laboratory and the final development made by numerous different tests, comparing various compounds and shapes.

### The Road Test.

Manufacturers of electric trucks have established methods of testing solid truck tires for ef-

ficiency and while few use the same test upon which their decision is based, a majority use what is termed the road test. In this test a chassis is loaded to normal capacity by means of accurate weights and driven over a measured course at a constant speed. The records kept in such a test consist of the time consumed in covering the course, volts, amperes, atmospheric temperature, wind velocity and direction, and road conditions. In some cases ampere-hour meters are used to



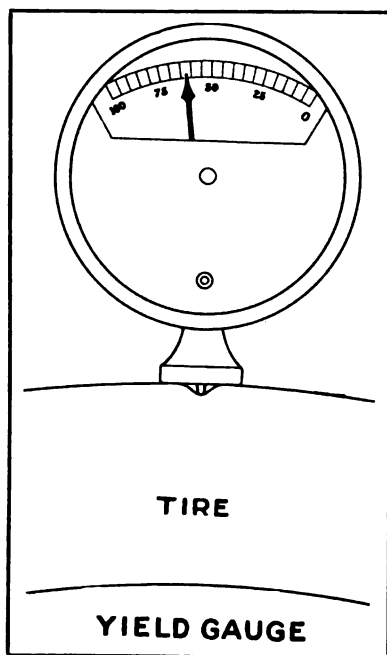
Upper View, Vibration Effect on Hard Compound; Lower, "Drag" on Soft Compound.

show the total current consumed, but as a general rule fully charged batteries are used in each individual test and total watts or ampere draw used as a basis for comparison. The tires showing the greatest efficiency are those covering the course at the greatest speed and with the lowest ampere draw or watt-hour reading.

There are many chances for inaccuracies in making this test, and unless tires of differing types and makes are tested under identical conditions a fair comparison cannot be established.

\*Assistant manager of the truck tire sales department, B. F. Goodrich Company, Akron, O.





For example, it will be observed that an accurate comparison cannot be made if two sets of tires are applied to different chassis, even though they are of the same weight and capacity. The friction and other losses of the moving parts, as well as the efficiency of motor and batteries, might vary so widely as to cause an apparent increase in power

consumption not attributable to the tires.

Differences in the atmospheric conditions during separate tests will be reflected in the final results, hence accurate comparisons may be expected only where practically identical weather conditions prevail. Since atmospheric conditions also affect road conditions, the same set of tires would not show the same results if tested on a dry course as over the same route after being wet. Temperature also plays an important part in affecting road conditions, as can best be illustrated in the case of asphalt. On a hot day the asphalt would soften, causing the tire to stick or drag and consume a greater amount of current than on a cold day when the asphalt would harden perceptibly, making a much faster course.

Wind resistance should also be constant in making comparisons, for it is obvious that more current will be required in running into a 20 mile an hour wind than one whose velocity is 10 or even 15 miles an hour.

The course over which road tests are run is usually either asphalt or good brick, and the final results show current efficiency and speed over but one type of road construction. In actual service the average electric truck meets all varieties of road and street construction and as a solid tire, most efficient on good hard asphalt, may show decreased efficiency over brick or cobble stones, and vice versa, the most satisfactory course is one including the greatest variety of paving. In this case an accurate average performance may be obtained. While the road test

is theoretically the most accurate in determining the tire or tires with highest current efficiency, in order that dependable results may be obtained, the foregoing conditions must be as nearly alike as possible and the testing course should be a fair average of actual street conditions in service.

#### Grade Test.

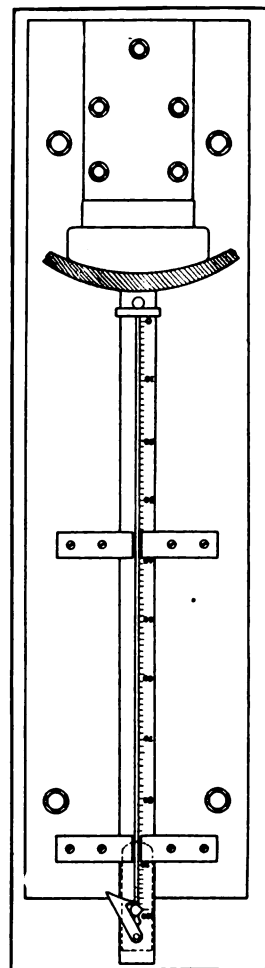
The grade test consists simply of noting the length of time elapsing from the instant the brakes are released on a truck standing on a 20 per cent. grade, to the instant of passing the end of the grade. In this test time only is figured, for no current is required, and as the grade is usually artificial not much dependence can be placed upon the results. Should the same complete chassis be used in testing various makes of tires the results would be fairly reliable for comparison only, but the conditions under which the test is made are theoretically too perfect for drawing accurate conclusions with respect to results in actual service.

#### Coasting Test.

This test is very similar to the grade test except that distance is the basis of comparison rather than speed. In making the coasting test the truck is run at highest speed up to a marked point, at which the down grade begins. Here the power is cut off and the truck allowed to coast until coming to a standstill. Many of the variable factors are encountered in this test, as outlined in the road test, but in the main, results are fairly accurate for comparison.

#### Impression Test.

This is a minor test used by one or two manufacturers and the results obtained are inadequate and unconvincing in comparing the efficiency of solid tires. The test is conducted by jacking a wheel from the floor, chalking the surface of the tire and removing the jack, allowing the weight of the wheel to rest upon a piece of cardboard or



Modified Form of Scleroscope.



heavy paper. Upon removing the cardboard an impression of the length and width of the arc of contact is obtained. By comparing these arcs for various tires the results are supposed to show the comparative hardness. However, even these results are inaccurate for different shapes, and the test can best be used as a check for uniformity in tires of the same make and shape. Efficiency in current consumption and speed cannot be determined by this test.

#### The Scleroscope.

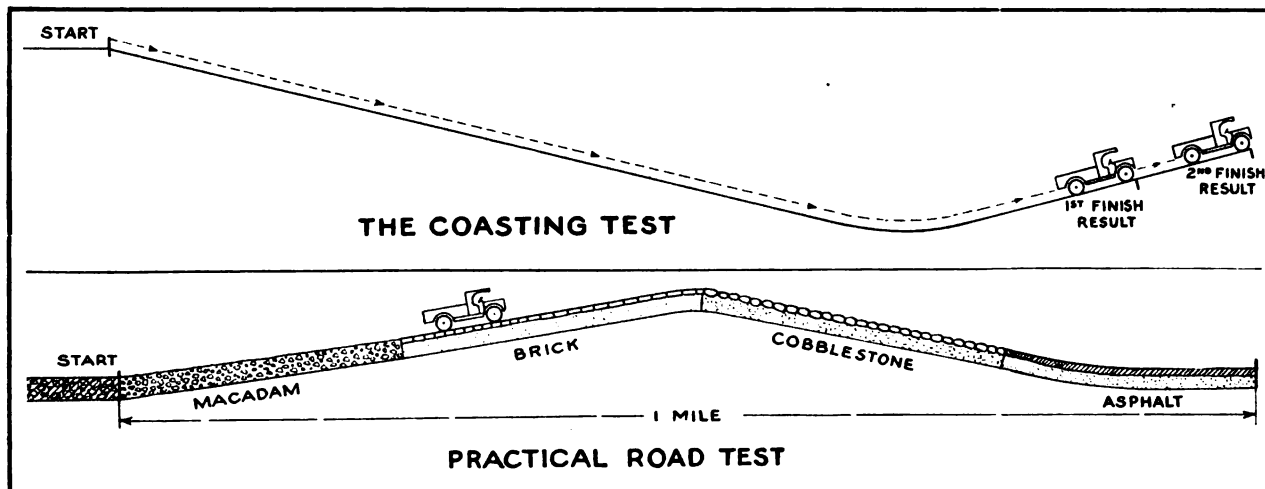
The scleroscope, an instrument primarily designed for testing the hardness of metals, is sometimes used to compare solid tires for efficiency. This instrument has been accepted as a standard by different authorities for testing hardness of steel, and while a trifle intricate in its make up, consists mainly of a glass tube, graduated to scale, through which a weight is dropped

be tested, the amount of resistance to the pressure of a standard spring balance is shown on a graduated scale.

This test results in only a determination of the hardness of various tires, hence is not reliable for tire efficiency in point of current consumption, but is a fairly accurate check for compounds found to be up to requirements in this regard.

#### Conclusions.

From the foregoing it is apparent that the electric truck manufacturer should not base his decision for tire equipment upon any one single test, but should, so far as possible, make a careful comparison of results obtained from several. Far too frequently truck manufacturers are willing to sacrifice increased tire mileage in favor of reduction in weight. Tire manufacturers from long experience have established standard carrying capacities for all tire sizes, and the strict ad-



and the rebound observed on the scale.

The results from this instrument are obtained by dropping a weight upon the tire and noting the rebound, the more resilient tires showing the greater rebound. This test is not accurate for tires or rubber compounds, unless test pieces of the same dimensions are used. The difference in the shapes of tires, as well as the possibility that the tube may not be perfectly vertical for all tests, allows a great chance for inaccuracies. Again, the testing conditions are more nearly ideal than those encountered in actual tire service.

Practically everyone is familiar with the common practise of testing the resilience of rubber by biting specimens with the teeth or pressing with the fingers. Since these are very unsatisfactory methods, an instrument known as the yield gauge has been produced to take the place of the uncertain element of "feeling". By pressing the blunt end of the gauge against the tire to

herence to this standard is one of great importance in securing satisfactory tire service.

From the point of view of the truck owner, the problem is one of obtaining a tire which will reduce his cost a battery charge to the minimum, and at the same time increase his ultimate tire mileage to the maximum. Primarily the operator wants low current consumption, but it is also advisable to bear in mind the high cost of frequent tire renewals, involving also a considerable loss of time. Unfortunately, the truck operator has neither the time nor facilities for conducting the tests described above, but in view of the fact that practically all users are maintaining accurate daily records, any losses in speed or mileage a battery charge are promptly noted. When such losses occur an investigation of the tire equipment may disclose the weakness, especially if motor, batteries and transmission test up to standard.

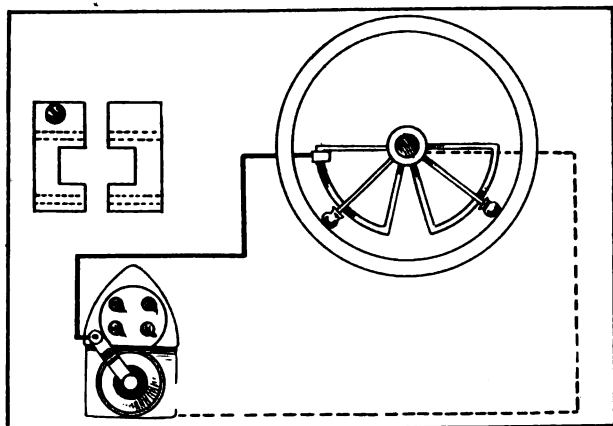


## MECHANICAL NOTES FOR OWNERS.

### Utilizing Spark Lever for Switch with True High-Tension Magneto--Home Made Hot Air Attachment for Carburetor--Timer Hint.

**W**HEN a true high-tension magneto is utilized for ignition purposes the secondary current is prevented from flowing to the spark plugs by diverting the primary or low-tension from the secondary windings, or, in other words, when the driver desires to stop the motor the switch lever is so moved that the primary circuit is closed. It should be explained that the type of switch employed differs from conventional practise in that to permit the magneto supplying secondary current to the plugs, the circuit is open. With batteries, coil, etc., the circuit is closed, and opened to stop the motor operating.

In the Oct. 25 issue of The Automobile Journal the Splitdorf true high-tension magneto for model T Ford motors and equipment for driving



**Suggestion for Utilizing the Spark Lever of Model T Ford for Switch When True High-Tension Magneto with Fixed Spark Is Employed, as with Splitdorf Ford Equipment.**

the instrument were described and illustrated. Included in the system is a dash switch, which is wired by attaching a lead from the circuit breaker spring terminal to it and carrying another lead to the metal support of the steering column. When the switch is closed the primary current of the instrument is diverted to ground as previously explained.

In an accompanying illustration is presented a suggestion for utilizing the spark control lever of the car for a switch, as it will be remembered that the Splitdorf magneto is of the fixed spark type. As the lever is of metal and the quadrant on which it moves is of similar material, and the post of steel, these components may be used for one side of a circuit or the ground.

By taking two small pieces of fibre and constructing them to the shape shown in the sketch, they may be attached to the quadrant as illustrated. The fibre pieces are drilled to take small bolts for clamping to the quadrant, and the outside clamp is also drilled to take a metal terminal. The brass screw of a carbon post of a dry cell could be utilized, placing the screw head on the side of the quadrant facing the driver.

The wiring plan is simple. Take a piece of insulated wire, strip one end and secure it to the screw in the fibre block, locking it with the nut. The other end of the lead is attached to the magneto terminal. With the spark lever in the position shown in the drawing, the circuit would be open, allowing the high-tension current to flow to the plugs. By moving the lever so as to make contact with the screw in the fibre piece, the circuit would be closed, stopping the motor. This plan is not only simple, but it makes for convenience, in that the motor could be stopped quickly if desired and without reaching over to the dash.

#### HOME MADE HOT AIR DEVICE.

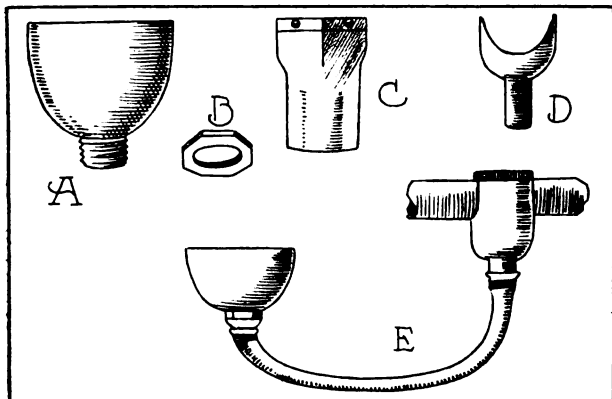
With the approach of cold weather owners are giving consideration to devices facilitating carburetion of the fuel. The modern machine is equipped with means for conveying heated air from the exhaust to the air intake of the carburetor, but many early models are not thus fitted. While attachments may be purchased, these may be made and in an accompanying illustration is presented a plan for fitting the model F Schebler carburetor with hot air connections.

The bowl A of the model referred to is retained by a hexagonal nut B, and as there is not room to attach other than a special fitting and nut, such as is marketed by a carburetor manufacturer, one can be made of sheet brass. Remove the nut B, drill and tap each side of the hex to take a small machine screw. Next take a strip of sheet brass and shape it around the nut as shown at C, fastening it by means of the screws. If shaping the brass proves troublesome any tin-smith will fit it for a few cents.

The hood member which clamps over the exhaust manifold may be made of a strip of brass and attaching to it the circular extension to



which is fitted the tube or pipe connecting with the air intake of the carburetor as shown at E. This connection piece may be flanged and riveted



Working Plan for Constructing Hot Air Attachment for Model F Schebler Carburetors.

on or soldered as convenient, but it should be remembered in constructing the hood piece D that space should be left for the entrance of air when attaching to the exhaust manifold. If fitted too close the pipe opening will be obstructed. The hood may be retained by wire or two bolts.

Flexible metallic tubing is not expensive and may be obtained at any supply house. The end attached to the hood can be soldered, while the other extremity is slipped over or inside the nut piece and retained by a cotter pin by drilling a hole through the walls of both pieces.

### SUPPORTING TIMER LEADS.

Primary wires fitted to the timer or commutator do not as a rule receive much attention until they give trouble, as the current flowing through these leads is of a low voltage. Where the timer is driven by a vertical shaft the wires are brought upward and more or less twisted together. In the event of trouble on the road the driver is obliged to trace each lead before he can locate the faulty member.

In an accompanying illustration is presented a suggestion from an owner for separating and marking the leads, and the device can be constructed from a piece of fibre and with little labor. It comprises a circular piece of material about .25 inch thick and about an inch or more in diameter. In it are drilled four holes, spaced equidistant as shown and these openings should be large enough to permit passing through the wires, yet preclude play and chafing.

The fibre is located as shown in the sketch, and to simplify matters the leads can be marked according to the firing order of the motor as indicated in the drawing, which in this instance is

1, 3, 4, 2, with the timer shaft rotating anti-clockwise or to the left. As previously mentioned, in the event of a missing cylinder, due to one of the timer leads, the wire can be located speedily and the trouble corrected. The plan could also be utilized with horizontal commutators.

### BATTERIES AND STARTING.

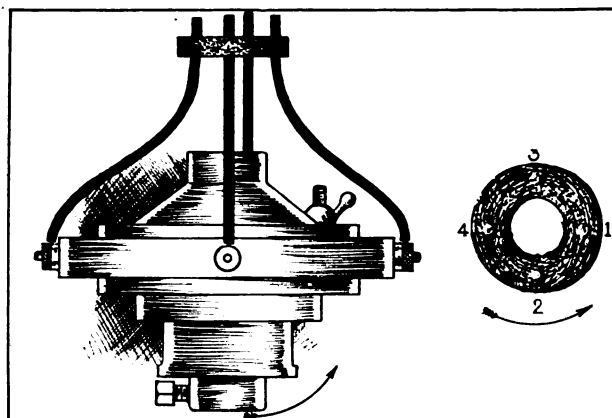
Owners of cars employing a dual ignition system, that is, batteries for starting, should give the cells or storage battery more attention at this season of the year than in warm weather when starting is much easier. Much of the trouble experienced in starting a cold motor is due to a weak spark. Test the cells from time to time and if not up to the specifications of the maker, install new members. If a storage battery is utilized, have it recharged. A good, hot spark is necessary for starting.

### HAVERS REPRESENTATIVES ABROAD.

Two Foreign Missions Now Under Way to Perfect Distribution of Product.

Travelling in the interest of the Havers Motor Car Company, Port Huron, Mich., Edgar A. Wilhelmi of New York City, sailed for England a short time ago, taking with him a Havers 6-60 car. After visiting England, Germany and France, Mr. Wilhelmi will sail for India and he has prospects of establishing several very desirable connections for the Havers company in each of these countries. His entire trip will keep him abroad about eight months.

While he is making the European tour one of



Easily Constructed and Fitted Fibre Disc for Retaining Timer Wires and Identifying Leads.

Mr. Wilhelmi's representatives will be in South America with the same make of car to establish agencies in that country.



## RECENTLY ANNOUNCED 1914 MODELS.

**A**N ENTIRELY new line, bearing the name of Jeffery, is the announcement made by the Thomas B. Jeffery Company, Kenosha, Wis., formerly maker of the Rambler and Cross Country models. Other new features among the latest statements from car makers include the Ohio line, to be produced by the Crescent Motor Company, Cincinnati, O., of which R. E. Northway, formerly of the Northway Motor Company, Detroit, is president, and the high powered Metropolis roadster from New York City, as follows:

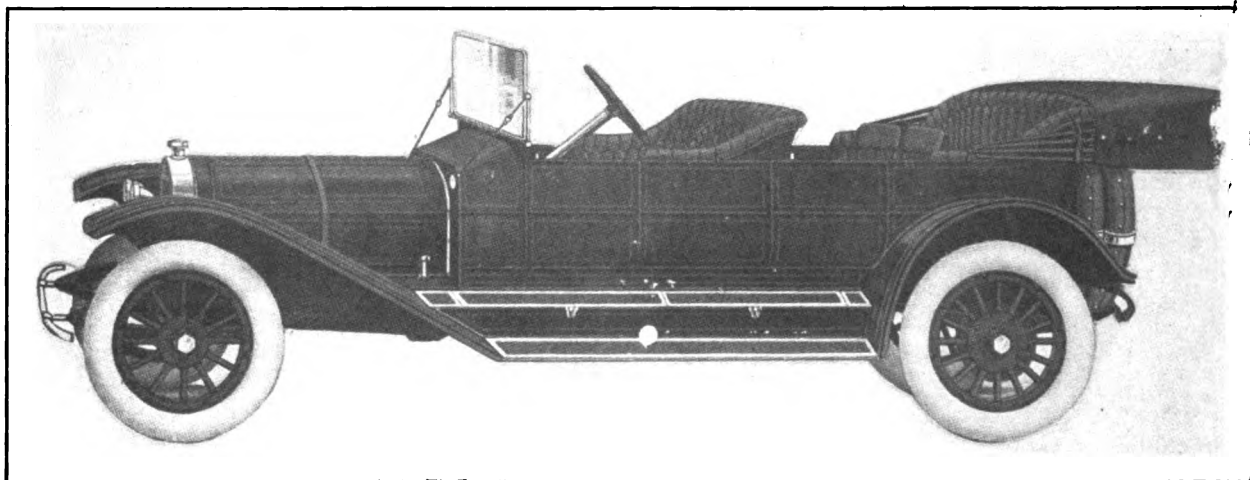
**McFarlan**—McFarlan Motor Car Company, Connersville, Ind. Six-cylinder. Motor, T head, en bloc, four-inch bore, six-inch stroke. Mea magneto. Stromberg model G3 carburetor. Centrifugal water pump, electric generator and air pump on left side of motor. Multiple disc clutch. Three-speed selective transmission. Full float-

rear axle. U. S. L. electric system. Power tire pump. Four has wheelbase of 116 inches and tires, 34 by four inches; six has 128-inch wheelbase and tires, 36 by four. Four in roadster, five-passenger touring and sedan, also two-passenger coupelette. Six in five and six-passenger touring, sedan and limousine.

**Mitchell**—Mitchell-Lewis Motor Company, Racine, Wis. Three chassis, two sixes and a four. T head motor. Four and larger six have 4.25-inch bore and seven-inch stroke, while smaller six has same bore and six-inch stroke. Remy ignition. Full floating rear axle. Seven-eighths elliptic springs. Left hand drive, centre control. Additional equipment. Four in two, four and five-passenger bodies; little six in the same and a seven-passenger big six, seven-passenger only.

**Metropol**—Metropol Motors Company, 1926 Broadway, New York City. Roadster. New. Motor, four-cylinder, four-cycle, water-cooled, vertical, T head, cast en bloc, 4.25-inch bore, 7.875-inch stroke, said to develop 90 horsepower under brake test. Large valve diameter, 2.5 inches. Lubrication, combined force feed and splash. Three speed selective transmission. Semi-elliptic springs. Artillery wood wheels, fitted with 33 by four-inch tires on Stanweld rims. Wheelbase, 115 inches, tread 56.

**Ohio**—Crescent Motor Company, Cincinnati, O. Mod-



The Luverne Automobile Company's Big Brown Luverne Self-Starting Six.

ing rear axle. Underslung three-quarter elliptic rear springs. Left hand drive, centre control. Two-passenger roadster, seven-passenger touring, four-passenger coupe and seven-passenger limousine.

**Oakland**—Oakland Motor Car Company, Pontiac, Mich. Model 35 four-cylinder, model 43 four-cylinder and model 48 six-cylinder. Model 35 continued with changes largely in the nature of refinements in design and equipment. Model 43 retains the same general outward appearance of the old model 42. Larger motor, 4.25-inch bore and 5.25-inch stroke, instead of 4.125 by 4.75. Model 48 is new and is designated a little six. Motor, 3.5-inch bore and five-inch stroke, L head, cast en bloc; four main crankshaft bearings of ample size; double exhaust manifold, and inlet manifolds of special Oakland design. Delco combined ignition, lighting and starting system. Leather faced cone clutch. Three-speed selective transmission. New special control lever bolts to rear of gearbox. Semi-floating rear axle. New method of brake adjustment. Model 35 as touring car and roadster. Models 43 and 48 as touring car, cabriolet, coupe and sedan.

**Jeffery**—Thomas B. Jeffery Company, Kenosha, Wis. Formerly Rambler and Cross Country. New throughout. Two models, a four and a six. Motors the same dimensions, 3.75-inch bore, 5.25-inch stroke; L head, cast en bloc on the four and in pairs on the six. Rayfield carburetor. Bosch magneto. Inverted cone clutch, fitted with clutch brake. Four-speed gearset with centre control. Left hand drive. Floating annular ball bearing

Royal and 4-35. Former has a six-cylinder motor, four-inch bore and six-inch stroke, multiple disc clutch, four-speed transmission, full floating rear axle, left hand drive, centre control. Latter has four-cylinder motor, 4.25-inch bore and 4.75-inch stroke; multiple disc clutch, three-speed transmission, full floating rear axle, right hand drive, inside control. Both with five-passenger touring car bodies.

**Luverne**—Luverne Automobile Company, Luverne, Minn. The big brown Luverne, self-starting six. Motor rated at 50 horsepower; unit power plant. Bosch magneto. Rayfield carburetor. Multiple disc, dry plate clutch. Selective transmission. Full floating rear axle. Wheelbase 128 inches. Tires, 36 by 4.6 inches, on Bakelite demountable rims. Pneumatic starting system, four-cylinder air compressor also supplying air for tires. Double lighting system. Five and seven-passenger touring bodies.

**Dorris**—Dorris Motor Car Company, St. Louis, Mo. Model I. Five and seven-passenger touring car. Motor, four-cylinder, vertical, water-cooled, valve-in-the-head type, cast in pairs, 4.375-inch bore, five-inch stroke. Greater accessibility of camshaft gears, bearings and motor starter. Larger valve diameter, three inches instead of 2.25. Flechter carburetor. Bosch magneto. Westinghouse electric lighting and starting system. Special Dorris dry plate clutch has more plates. Larger tires, 26 by 4.5 inches, mounted on Stanweld rims. Left hand drive, centre control.



## ENGINEERS DISCUSS CYCLECAR DEMAND.

**D**EVOTING its entire time and attention for the evening to the subject of cyclecars, the Metropolitan Section, Society of Automobile Engineers, at its meeting in New York City, Oct. 29, discussed the possibilities and prospective developments in this newest branch of the industry in America. One or two of those present contended that the present low priced automobile and the motorcycle in their respective fields were all sufficient, and that there was not room between them for another type of self-propelled vehicle. It was the opinion of a majority of the speakers, however, that a distinct and very large demand for an intermediate type would develop as soon as suitable products were offered, but whether such machines would partake more of the automobile than the cycle features was a question that remained unsettled after several hours of debate, in which a large number of the 25 members and guests participated.

One of the points concerning which a difference of opinion arose was that of tread width. It was contended by two or three speakers that a vehicle of less than standard gauge cannot successfully negotiate American country highways, while others were equally insistent that the narrow tread is no bar to the service for which the cyclecar is properly suited. W. Irving Twombly, one of the several cyclecar makers present, held that while the narrow tread vehicle might prove unsuitable for touring, it was distinctly suitable for town and suburban work, where its width greatly facilitated progress through traffic. He explained that a cyclecar would be in proper proportion throughout, and borrowed a phrase from one of the papers of the evening when he said it should have the appearance of a true automobile viewed through the wrong end of a telescope. The application of bodies of streamline design he also urged as important.

#### Sounds Note of Caution.

Suggesting broadly that established makers of both small cars and motorcycles, who already have large factories and well knit sales organizations, would waste no time in turning to the cyclecar once its immediate profitability became apparent, Alden L. McMurtry, a consulting engineer, sounded a note of caution to those who may be inclined to rush into cyclecar manufacture prematurely. In a carefully prepared paper, he outlined the present commercial limitations under which the cyclecar builder must work, in part, as follows:

The cheapest motor vehicle is the motorcycle. Next to it is the cheap automobile. Most of you are aware of the characteristics of the cheap automobile, yet very few really know the modern high powered motorcycle.

The most fancied fault of the motorcycle is that it is uncomfortable. On the contrary, I was surprised at its easy riding qualities. It is true that you feel the bumps of the road, but not any more, and in most cases less, than when sitting in the rear seat of some small automobiles. The side or tilting motion of the automobile is entirely eliminated. It is possible with the motorcycle to pick the smoothest part of the road and therefore attain a higher rate of speed with more comfort than in the average small automobile.

#### The Situation Abroad.

The cylinder volume tax in some foreign countries was so heavy that the manufacturers designed cars fitted with small, high speed motors. These small cars were in most cases exact duplicates of the regular product, except on a much smaller scale. These cars proved that a small, high speed motor, with a four-speed transmission was the equal of the large, slow speed American motor with a two or three-speed transmission. It is a mistaken idea that these cars were designed solely to compete with the inexpensive American car, as some appeared on the highways abroad long before the so-called invasion of the American car.

After consideration of the motorcycle with the sidecar attachment and the miniature automobile, the following questions arise: Cannot a motorcycle be made with four wheels and arranged with a comfortable two-passenger body? Considering the design of the miniature car, is it necessary, when building a smaller car, to follow precisely accepted automobile engineering practise?

#### The Cost Consideration.

The questions would imply that the fundamental consideration was cost, since the scope of the motorcycle is to be enlarged, while that of the miniature car is restricted. Assuming that a two-passenger car containing all the essentials of the motorcycle, thereby avoiding apparently the expensive construction of the automobile, or a miniature car built on a lesser degree of refinement would answer the requirements. Manufacturers of such a car have named it a cyclecar. We have two types of cyclecar—the modified motorcycle and the small automobile.

If it is possible to build a cyclecar which embodies almost all the essential parts of the motorcycle, why are not the motorcycle builders making them? Why are so few interested?

The price of the modern motorcycle averages between \$250 and \$325, and when equipped with a sidecar between \$335 and \$400. If we take the price of a motorcycle as a basis of comparison, then a motorcycle type of cyclecar should reasonably cost over \$500. This is provided, however, the proposed cyclecar is built with the same sterling quality of workmanship and material which may be found in the modern motorcycle.

The characteristics of such a car in respect to speed, power and method of control would eliminate it from the cheap automobile class. In other words, the advantages of rapid acceleration, taking all hills on the high gear and possible overloading would be discarded in return for the presumably economical cost of upkeep with respect to fuel and tires. Substantiation of the foregoing is found in the fact that the so-called cheap price of the foreign cyclecar averages over \$600, and that the detail design and workmanship of the car is not to be compared with that of the foreign motorcycle.

#### Demand for Cyclecars.

We have in this country a car, the design of which afforded amazing manufacturing possibilities which have materialized. The success of this type of car is responsible in a great many respects for the cyclecar agitation. Almost 80 per cent. of the proposed American cyclecars are designed to compete, more or less, with this class of automobile, and as such could hardly be called cyclecars.

As the cyclecar is at present of considerable interest, it is natural to hear of a great demand for them. Has this demand been analyzed? Is it a question of what is wanted, or what can be supplied? Does the question of cost supersede mechanical construction? Does the de-



mand actually exist, or is it a question of many inquiries and few sales?

It is not my intention to appear pessimistic on the subject. However, the cyclecar has afforded questionable promoters a new excuse to organize manufacturing companies to build cyclecars at ridiculously low figures. Automobile engineers should discuss the cyclecar frankly and fearlessly in order that the public will know its limitations. Enthusiasm over the cyclecar should be limited to that which is supported only by fact.

### Manufacturing Economies Reviewed.

Joseph A. Anglada, chairman of the section, after outlining cyclecar limitations according to the European definition, briefly reviewed the manufacturing economies that the simple design of the vehicle renders possible. He said in part:

The present conventional design of a low priced American automobile comprises a pressed steel frame, a four or six-cylinder motor, a friction clutch of the cone, disc or band type, a sliding gear transmission giving two, three or four forward speeds, bevel gear or worm driven rear axle, semi-elliptic, platform or transverse rear spring. The selling price of cars designed along these conventional lines is somewhere in the neighborhood of \$1 a pound for a touring car and as low as 50 cents a pound for the later type of small runabout.

#### The Conventional Automobile.

The conventional car having these specifications contains somewhere in the neighborhood of 1000 detail parts, these not including specialties, such as starters, electric light equipment, windshield, top, etc., and such items as nuts, bolts, studs, washers and details of smaller character which are bought in stock from wholesale manufacturers. Of this large number of details there are some which are of duplicate design; that is, there are two or more parts of exactly similar form and materials, for instance, the pistons, connecting rods and bearings. Regarded in this way, the number is reduced to perhaps 400 dissimilar parts.

To manufacture these parts from raw materials requires bars of various sections and of different grades, and various castings of iron, bronze, aluminum and brass, in addition to forged and pressed and stamped parts. The proportion of these various forms of material may be taken roughly as: Castings 100, forgings 90, pressed and stamped parts about 20, and the remainder in the form of bar stock, tubing and sheet metal. If it is desired to produce such a conventional car in miniature, the number of individual parts cannot be diminished to any great extent, the main difference being in the amount or weight of material required for each part.

#### Establishing New Conventions.

A few years ago when a car to be sold for \$500 was first talked about, it was impossible to build a good car to sell at this price, because manufacturers of parts, such as axles, transmissions and engines, were not prepared to furnish parts suitable for these small cars. Since that time, however, manufacturers have begun to realize that there is a demand for a small car selling around \$500 and some of them are now prepared to furnish from stock the important units entering into the construction of such a car, and for this reason we may reasonably expect that the number of runabouts selling for about \$500 will increase.

On the other hand, simplification of design, that is, the development of a small machine and the establishment of new conventions in designs and specifications (considering that the present \$500 machine represents present day conventions) will make possible the economical manufacture and sale of small cars in accordance with the new conventions, and these small cars will probably be known as cyclecars.

#### Factors in Manufacturing Economy.

The total weight of the small car and the cyclecar can readily be brought within the European cyclecar definition, although, undoubtedly the simpler design of the cyclecar will result in less weight. Assuming, however, equal weight in the initial purchase of materials there is an important difference in the manufacturing cost of the two cars. The number of patterns is reduced. The number of dies, jigs, special tools, etc., with their attendant cost, is reduced, and with the smaller

number of parts in the cyclecar these parts will be simpler and more rugged in construction, with the resulting increase in bearing surface and a corresponding reduction in the cost of maintenance.

It is quite apparent that a reduction in the number of detail parts of dissimilar design has a direct bearing on the economy of the manufacturing department. In the first place, it lessens the expense of handling different materials and parts, and the clerical work attendant upon their receipt and inspection. In the purchase of fewer varieties of raw material and its transit through the various processes of manufacture and inspection, the cost is further reduced. The process of assembling the simpler cyclecar is also less expensive than that of the conventional small car, and likewise the expenditures for final testing, locating of faults and adjustments are also obviously reduced. Further, simplification of design is of vital importance to the owner. It lessens the amount of attention required to keep the car in first class condition and because of the greater ruggedness of the individual parts lessens the number of replacements.

Cyclecars and motorcycles were contrasted to the advantage of the former in a paper by Harry J. Stoops of the American Cyclecar Company, while the opposite view was expressed in a paper prepared by P. J. Bailey of the Consolidated Manufacturing Company. J. E. Merkel, a pioneer motorcycle designer, in a crisp and suggestive contribution, predicted a great future for the miniature car type, while a paper, prepared in behalf of W. S. Frazier & Co., expressed equal enthusiasm for a type embodying somewhat simpler forms.

Statistics drawn from British cyclecar practice, which were presented at the meeting, indicated a tendency to justify the designation of the new type by developing new characteristics bred of both cycle and automobile design.

### NEW HAYNES NAME PLATE.

#### Artistic Design Replaces Conventional Method of Displaying Maker's Trade Mark.

A handsome new name plate now adorns the radiators of the latest models of the Haynes car, made by the Haynes Automobile Company, Kokomo, Ind. It is three inches high and the same width and is reproduced in the national colors.

At the top the word Haynes stands out prominently in red against a background of white enamel. Then comes a reproduction of the first gasoline driven automobile invented and built by Elwood Haynes in 1893, which is embossed in aluminum in strong contrast with its background of blue enamel. Below is the company's slogan, "America's First Car", in red against a blue background.

The new plate itself is decidedly distinctive as well as attractive and is held by the company to be a decided improvement over the previous method of displaying the Haynes name on the radiators.



## TO BUILD CARTER PISTON VALVE MOTOR.

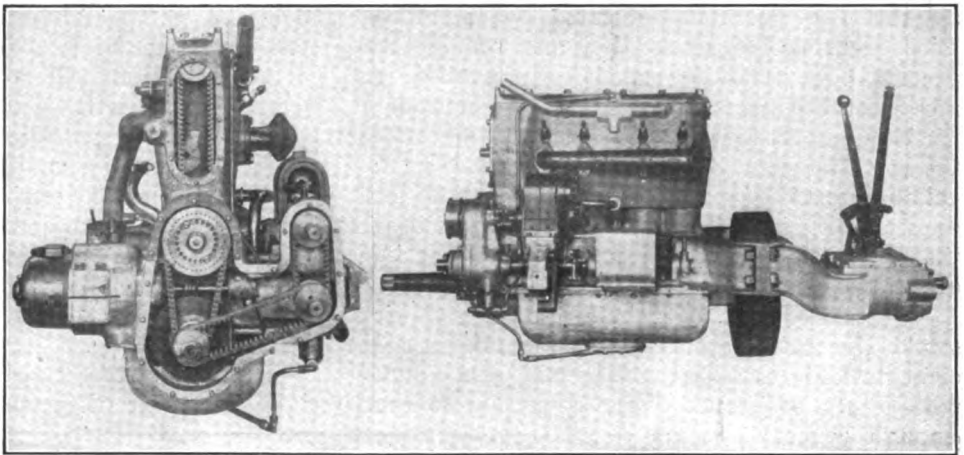
**A**LTHOUGH it was generally known that the Model Gas Engine Works, Peru, Ind., was developing a new piston valve type of motor, definite details were not announced until recently and until the company was ready to demonstrate the design to engineers. The first type to be marketed is a unit power plant along the general lines of the standard Model units, a four-cylinder motor having a 3.75-inch bore and 5.75-inch stroke. It will be produced at the Peru factory, but it is the intention of the company to build it in the new plant now under construction at Pittsburg, Penn.

The Model Gas Engine Works secured control of the patents to the Carter piston valve motor about a year ago and up to the present 14 claims have been allowed. While the new motor follows conventional practise in many respects, it possesses many original features and also combines principles indorsed by sound engineering practise. Among the points emphasized by the maker are a quicker valve opening than with other types, absence of noise, less vibration, 20 per cent. greater economy, 20 to 30 per cent. higher piston speed, 20 to 25 per cent. more power for piston displacements, less heat passed off through the water jackets, non-carbonizing valves, components not exposed, and a more serviceable and enduring motor under all requirements of service.

As will be noted by an accompanying drawing the cylinder bores are made much longer than required by the piston stroke and compression space, and the piston valves fit into this extension of the bore, being of the same diameter as the power pistons. Inlet and exhaust ports are provided in the walls, approximately one-third of the distance from the top, the ports being adjacent with the inlet above. The piston valve replaces the usual cylinder head, and by its movements alternately uncovers the ports.

The valve piston is fitted with three compres-

sion rings, but on its extension at the bottom are provided two expanding rings, A A, these closing the intake port C and exhaust port D, and replacing the conventional poppet valves. The valve pistons have the usual wristpin, and large rollers are mounted on the piston pin. The pistons extend upward, having a double bridge across the top of each. The camshaft extends across the top of the motor, the cylinders and valve pistons being slotted to receive these components. There are three cams for each cylinder, the central member F coming into contact with the roller H, while the two side cams are duplicates, and are so formed that when the roller follows the central cam the bridge will always be in contact with the side cams E E. These cams are so



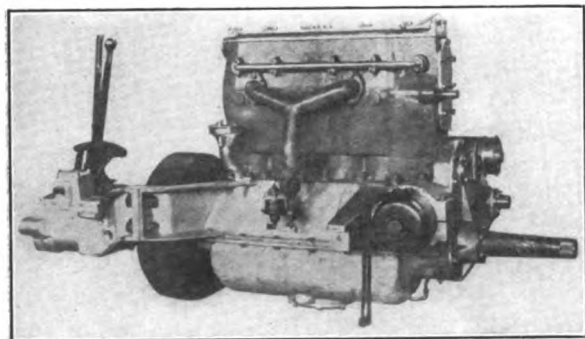
Features of Carter Motor: At Left, End View, Showing Silent Chain Drive of Camshaft, Water Pump, Magneto and Drive of Motor-Generator; at Right, Exhaust Side.

ground that each movement of the piston valve corresponds to that of the poppet valve. The movement of the piston valve, is, therefore, positive in each direction. The intake and exhaust ports extend entirely around the cylinder, with the exception of a small space for the split of the expansion rings.

The operation of the mechanism is shown in accompanying illustrations, the piston valve being shown at the top of its travel and with the exhaust port open. In carrying out the four strokes of the cycle, the cam F moves the valve down until the intake port C is uncovered, the exhaust port being covered at the same time. When the valve is opening, the position of the point K on the valve is indicated at L on the cylinder wall. On the suction stroke the vacuum



is sufficient to draw the upper piston after it to its desired position, the cam serving as a stop or a timing of the movements of the mechanism.



**Intake Side of Carter Motor, Showing Method of Retaining Motor Starter.**

At the completion of the intake stroke and at the beginning of the compression, the valve moves upward but .25 inch, so that the rings A A assume the positions indicated by the dotted lines. During this stroke the valve remains stationary, both ports are sealed and upward movement of the valve is prevented by the contour of the cam F. Near the end of the working stroke the valve moves upward .25 inch, uncovering the exhaust port. It will be noticed that at no time does the travel of the valve exceed .25 inch and that the total is but .5 inch in the two revolutions of the cycle.

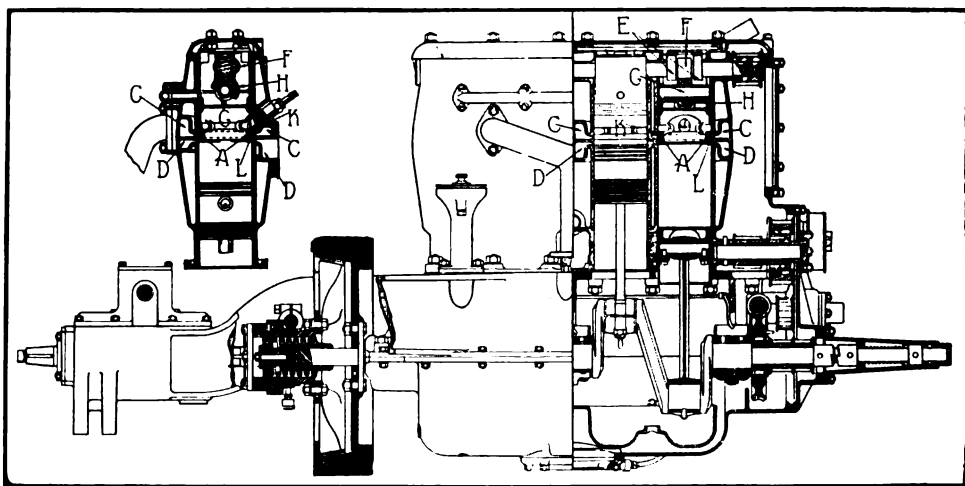
It is stated that near the end of the working stroke the pressure on the upper piston is sufficient not only to raise it for opening the exhaust without the assistance of the cams, but to exert enough energy to materially relieve the camshaft driving mechanism. On a six-cylinder motor this energy, it is stated, is sufficient to actuate the camshaft so that the driving mechanism merely synchronizes the timing.

The maker compares this engine with a poppet valve motor of the same bore and stroke, having 1.75-inch valves with .375-inch lift. The following figures are taken from its statement: The piston valves must move .09375 inch, or equal to 98 degrees,

on the flywheel before the port begins open. From the beginning to the full opening of the valve requires 62 degrees more, as compared with 102 degrees in a well designed poppet valve motor. At 23 degrees (.03125 inch lift) the poppet valve lift would be .17 square inch, while that of the piston would be 1.10 square inches. At 34 degrees (.0625 inch lift) the poppet valve would give .34 inch opening and the piston valve 1.43; 40 degrees, or .09375 inch lift of the poppet valve, gives openings of .51 and 1.53 respectively, and 58 degrees, corresponding to half the lift of the poppet valve (.375 inch), gives openings of 1.03 and 1.70 inches. The total area of the piston valve is 1.75 inches, as compared with 2.06 inches for the poppet valve. By the above it will be seen that the last item shows the poppet valve one-half opening with one-half the area of the valve, while the piston valve opening is within .05 of full opening. The number of degrees on balance wheels required to open the poppet valve .03125 inch gives the piston valve opening approximately 6.5 times the area.

Accompanying illustrations show that the overhead camshaft is driven by silent chains through an idler sprocket, this construction permitting the use of a small sprocket at the top, also serving to bring the upper chain close to the cylinder. A nearly horizontal chain drives the water pump, while another silent chain drives the magneto from the magneto and pump shaft. All chains are enclosed in the front of the motor and are very accessible.

The motor starter-generator is located on the right hand side of the power plant, the starter



**Sectional Views of Carter Motor, Illustrating Piston Valve, Cams and Actuating Mechanism.**

driving through a single worm and reduction gear, located transversely. It is clamped into a bored seat in the crankcase casting on the right.



## IN THE COMMERCIAL VEHICLE FIELD.

### Commerce Wagon to Make Novel Trip Around the World—Kelly Truck Fitted with Dumping Body—Republic Model—Lippard-Stewart with Worm Drive.

**J**OSEPH D. Wilkinson, with the Smythfield Export Company, 1216 Arch street, Philadelphia, has outlined a novel trip around the world, in which the 1000-pound Commerce truck, made by the Commerce Motor Car Company, Detroit, will play an important part. The selection of this make of vehicle was with the view of presenting a light delivery wagon which should meet with a ready sale in every section of the world, and it is expected that the arrangement will result in the ultimate shipment of 250 of these trucks to points which will be specified later.

Ten men will sail from San Francisco for Sydney, Australia, Dec. 12, and they will be gone at least two years. These 10 men will represent the export company, and Mr. Wilkinson will be one of them. Each will have charge of a separate commercial line, and the truck will be requisitioned to transport the other lines overland through the various countries visited. It is reported that the expenses of the party have been estimated at close to \$375,000.

One trip that is to be made will be from Singapore to Upper Laspur, in the Straits Settlements, and it is here that Mr. Wilkinson believes he will make his largest commercial car deal, since it is more or less well known that planters and traders in that section are anxiously awaiting the arrival of a motor vehicle which will be able to undertake the successful transportation of rubber, etc.

#### KELLY DUMPING BODY.

#### Interesting Equipment That Is Now Fitted on Three-Ton Truck Chassis.

The Kelly-Springfield Motor Truck Company, Springfield, O., is fitting its three-ton truck chassis with a power dumping mechanism that is

designed to be operated in such manner that one man can handle the machine and unload it with minimum loss of time. The hoist is the product of the Wood Hydraulic Hoist Company, St. Paul, Minn., and is operated by pumping oil into and out of an upright cylinder carried in the centre of the chassis frame behind the driver's seat. The body fittings and the power transmission by which the hoist is driven are the products of the Kelly company's engineers.

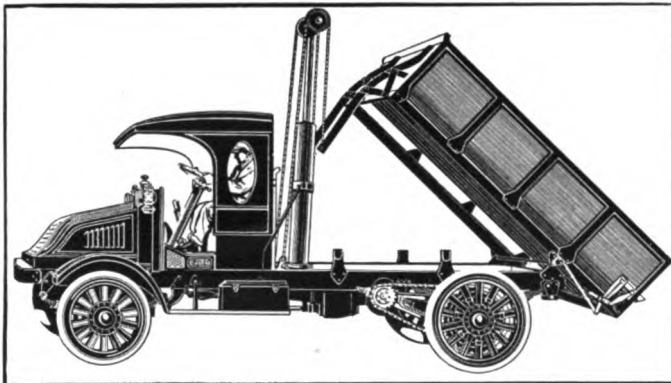
The hoist itself consists of a long steel cylinder on a base bolted to the chassis frame, and in this is a long trunk piston fitted with two rings. The piston carries a rod two inches in diameter, that extends through the upper or head plate of the cylinder, and to this is attached a cross arm on which two steel grooved pulleys are mounted. The forward ends of the two lengths of steel

wire cable are attached to an equalizer, which insures equal strain on each cable, and the rear ends are fastened to the lifting arms attached to the steel body.

At the base of the cylinder is fitted a gear driven pump, which is operated by chains and sprockets

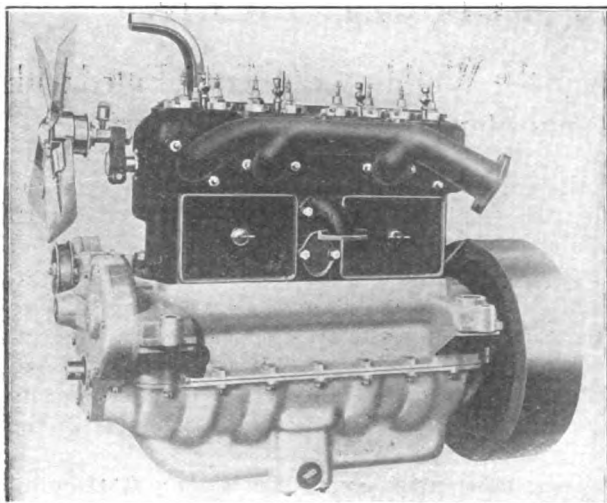
from an extension to the countershaft of the transmission gearset. The speed of the pump is three times that of the chassis motor, the power of which is utilized in lifting the body. The driver disengages the clutch, as though he were about to shift the speed changing lever, and when the countershaft of the gearset has been brought to a standstill, a lever at his right is moved and the power connection is made. The engagement of the gear carried on the extension of the gearset countershaft is locked in the same manner as with the conventional gearset, by spring plungers.

Because of the positive lock, the driver can leave his seat with the hoist in operation. After the hoist has been started he may walk back to open the tail gate, and return to the seat at the right side of the truck, where there is a hand lever



New Kelly Power Dumping Body at Its Extreme Elevation.





Valve Side of Continental Motor Used in New Republic Delivery Wagon.

which controls the action of the hoist. By pushing this lever from him the body will lift, and by pulling it toward him the body is lowered. When in a vertical position the hoist is in neutral. When the body has been lowered, the driver can seat himself, disengage the clutch, pull the hoist lever into neutral and start the truck.

### REPUBLIC DELIVERY WAGON.

Standardized Production of the Alma Motor Truck Company, Alma, Mich.

The Republic delivery wagon, rated at 1500-2000 pounds capacity, is specialized by the Alma Motor Truck Company, Alma, Mich., but one type of chassis being produced. The machine is designed from standard productions of manufacturers who specialize in the building of motor vehicle parts, and it is maintained that the workmanship and materials have proven decidedly satisfactory from every viewpoint. It is further claimed by the maker that all of the units are from 50 to 100 per cent. over-size, and that some of them are to be found in vehicles that have twice the rated capacity of the Republic.

The motor is a Continental, four-cylinder, water-cooled, L head type, with the

cylinders cast en bloc. The bore is 3.75 inches and the stroke 5.25, giving a conservative rating of 25 horsepower. Lubrication is by combination force feed and splash, the oil being filtered as it is drawn from a reservoir in the base of the crankcase. Ignition is by Eisemann high-tension magneto, mounted on a bracket at the right side of the motor, and the spark is fixed. The carburetor is a standard float feed, automatic type. The engine is suspended in a sub-frame at four points, and the radiator is carried on trunnions that are mounted in supporting cylinders between helical springs.

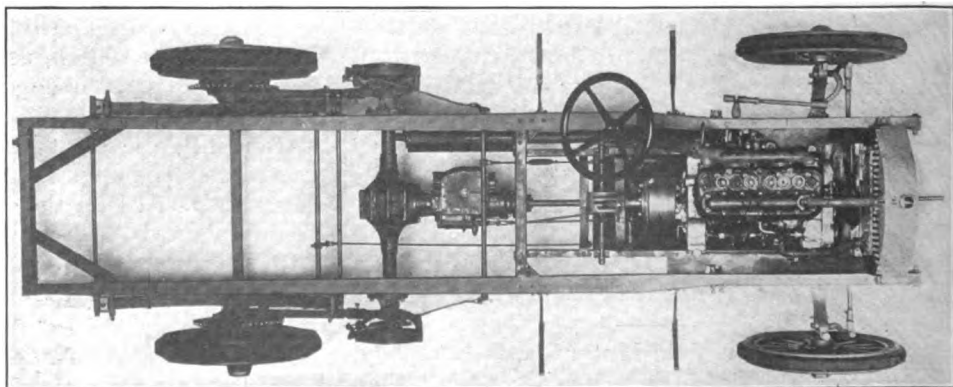
The clutch is a Hartford leather faced cone of large diameter. The Covert sliding gear transmission affords three forward speeds and reverse. This is incorporated with the jackshaft, the latter being made by the Russell Motor Axle Company. Two universal joints are employed between the clutch and transmission gearset. Final drive is by detachable link chains.

The chassis frame is of large steel channel section, strongly built and with ample reinforcement. This is suspended on semi-elliptic springs. The axles are steel drop forgings. Wheels are of the artillery type, shod with 34 by 3.5-inch tires in front and 34 by four-inch tires in the rear. The service brake is of the contracting band type and operates on 10-inch drums on the ends of the jackshaft, while the emergency members are of the internal expanding type, operating within 14-inch drums on the rear wheels. The wheelbase is 116 inches, with option of 124 inches.

### ANOTHER WORM DRIVEN MODEL.

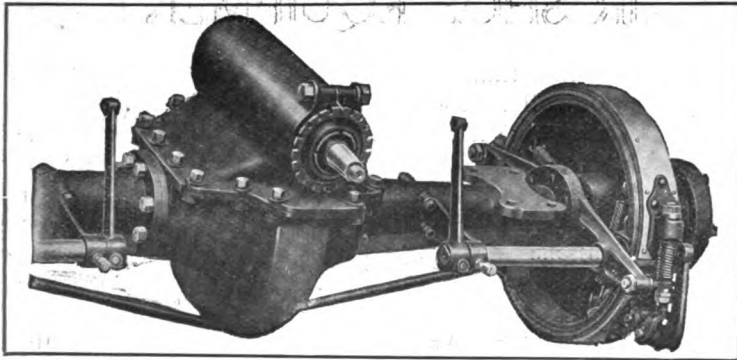
Lippard-Stewart Motor Car Company Announces a New 3000-Pound Chassis.

The list of American motor truck manufacturers producing worm driven chassis is still fur-



General View of Republic Chassis with Rated Capacity of 1500-2000 Pounds.





Rear Axle Construction on Lippard-Stewart Worm Driven Model.

ther increased by the announcement of a 3000-pound truck of this type by the Lippard-Stewart Motor Car Company, Buffalo, N. Y. Heretofore, this concern has specialized in the production of a 1500-pound delivery wagon chassis, to which have been fitted six standard types of bodies, and this will be continued. In general characteristics, aside from the rear axle construction, the two models are essentially the same.

The Continental motor is a four-cylinder, water-cooled, L head type with bore of 4.125 inches and stroke of 5.5, and with cylinders cast en bloc. The clutch is a pressed steel cone faced with leather, beneath which springs are installed to insure ease of engagement. The transmission is selective, affording three forward speeds and reverse. The main driving shaft is in two sections, the rear end of the forward half being carried on a self-adjusting ball bearing mounted on a frame cross member, this construction eliminating side pressure, and when the chassis is loaded the driving shaft is practically in a straight line. There are three universal joints, one back of the gear-set and one at each end of the rear section of the driving shaft.

The rear axle is the Timken-Brown full floating type, the housing being in three sections. The centre section contains the differential and the worm shaft and wheel, and to this the tubular sections are bolted. The housing is strongly ribbed and trussed. The worm shaft is steel and the worm wheel of bronze. Timken roller bearings are used throughout. Lubrication of the worm shaft is by

troughs in the housing, these carrying oil as it is distributed by the centrifugal movement of the wheel. By means of cleaning holes the worm, wheel and differential may be washed when necessary.

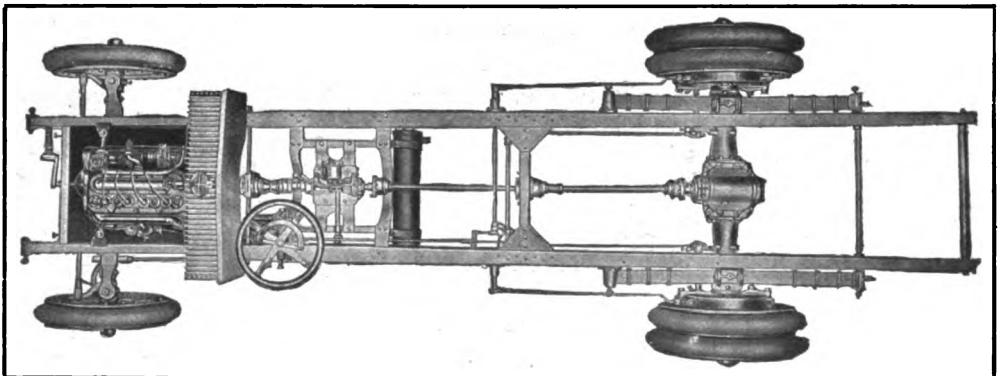
The front axle is an I section steel forging with a solid rectangular centre reinforcement. Both sets of brakes operate on the rear wheels. The wheel-base is either 145 or 158 inches, and bodies of 10 and 12 feet may be installed without overhang. The motor is mounted in front under a sloping hood, as with the smaller machine, and the driver is at the left. The company is prepared to supply this chassis with bodies of standard types.

### BELIEVES CONDITIONS GOOD.

#### President Kissel Predicts a Successful Year in the Automobile Industry.

Speaking of the automobile industry, George A. Kissel, president of the Kissel Motor Car Company, Hartford, Wis., in a recent interview, was very optimistic and predicted very successful results for the future. With reference to the condition of his own company, he said that business prospects were very bright and not only were domestic sales far in advance of any other year in its history, but everything pointed to a great increase in the foreign trade.

He said that contrary to the yearly custom the company found it imperative, on account of large business, to run to full capacity during the months of June and July, which proved to be a popular innovation, and allowed the company to deliver its 1914 models at an advanced date. Excepting the month of December, when it will be necessary to take the annual inventory, the Hartford and Milwaukee plants will be run to their full capacity during the entire 1914 season.

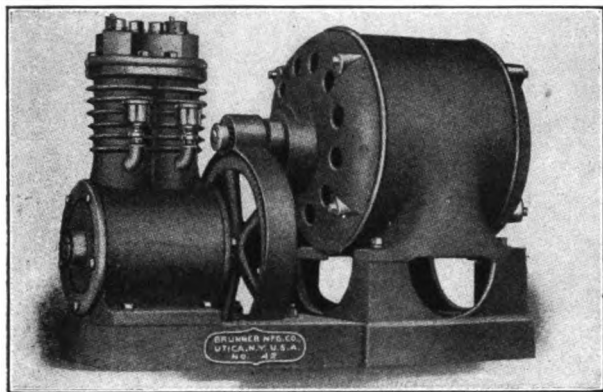


Plan View of New Worm Driven Lippard-Stewart 3000-Pound Wagon Chassis.



## GARAGE AND REPAIR SHOP EQUIPMENT.

**M**OTOR driven air compressors are now considered standard equipment in the garage, repair shop and service station, the design vary-



**Parker Double-Cylinder Motor Driven Air Compressor.**

ing according to the service required. The Brunner Manufacturing Company, Utica, N. Y., is producing a number of different types, that shown in the accompanying illustration being adaptable to many varying classes of service. The complete outfit is self-retained and operates with so little vibration that it can be installed, if desired, without fastening to the floor.

The No. 42 Parker outfit, as it is termed, comprises, in addition to the motor, a double-cylinder vertical compressor with cylinders having a bore of 1.825 inches and stroke of 2.5. The guaranteed pressure with a standard motor is 130 pounds to the square inch, although the compressor can be fitted for higher pressures upon order.

Lubrication is by the splash system and the motor bearings are oiled by ring oilers on the shaft. The height is 16.5 inches and the floor space required is 18.5 by 11 inches. The net weight is 170 pounds; shipping weight, 200.

Energy is supplied by a .5 horsepower electric motor, and drive is by a cast iron spur gear and a rawhide pinion. The compressor is driven at a speed of 350 revolutions a minute, and has a capacity of 4480 cubic inches (2.5 cubic feet) of free air a minute. The outlet is tapped for a .25 inch iron pipe. The finish is gloss black enamel. The motor is a direct current machine or single-phase alternating current, 110 or 220 volts. Motors of any frequency on alternating current are supplied at an extra cost.

The outfit can be made automatic with an electric controller and any desired pressure can be maintained day or night without any other at-

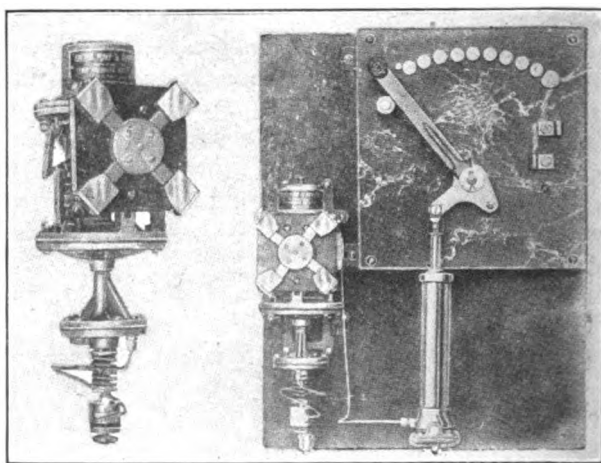
tention than an occasional oiling. Two types of controllers are shown in an accompanying illustration, that at the left being designed for service with single or two-phase alternating current motors of two horsepower and less. The No. 91 is shown at the right and is similar to the other, but has a rheostat for all direct current motors and such alternating current motors as require starting resistance or a rheostat.

As previously stated these controllers maintain a constant air pressure at all times and are stated to be extremely accurate and reliable. They can be adjusted for operation on a wide variation of pressure, or set to start and stop the motor within a variation in the tank pressure of two to three pounds, if desired. The construction is simple, only two diaphragms being used, these presenting such a small portion of their area to the pressure that they are practically wear proof. The contact points are of the wiping variety, insuring a clean surface at all times, and eliminating sparking.

The Brunner Manufacturing Company is issuing a new catalogue illustrating and describing air compressors, which will be mailed free.

### FORD FELT WASHERS.

N. E. Booth, 644 Pacific street, Brooklyn, N. Y., maker of felt washers, gaskets and packings, is manufacturing a special felt gasket for insertion between the engine base and crankcase of



**Electric Controllers Utilized with Parker Air Compressor Outfits.**

model T Ford motors. The gasket comes in shape for immediate use and with all the bolt holes punched in it.



### HOYT FORD MAGNETO TESTER.

The Hoyt Electrical Instrument Works, Penacook, N. H., well known maker of current



testing devices, is manufacturing the Hoyt Ford magneto tester, shown in an accompanying illustration. As the name implies, it is designed to show the quality of the electricity generated by the flywheel magneto on model T Ford motors, and the dial of the instrument is calibrated. The meter is compact, being

Hoyt Ford Magneto Tester.

3.5 inches in diameter, and is constructed of the same high grade material and with the same careful workmanship for which the product of this concern is noted.

One of the most difficult troubles to locate with the Ford motor is the ignition, and many times weak magnets are the cause of the cylinders heating and lack of power. The Hoyt company conducted a series of tests with 100 cars, the experiments extending over a period of 12 months, and it was found that almost invariably a magneto which indicated below a certain point of the scale would not operate continuously without skipping, and that at another point, while operating without skipping, the gasoline consumption was higher.

For the purpose of simplifying the use of the Hoyt magneto tester these two points were indicated as "Poor" and "Medium". The lowest point of efficiency, that is, the point at which the motor would operate without skipping and with reasonable fuel consumption, was indicated on the scale as "Fair". A small percentage of cars tested showed as high as "Good", while a few tested "Extra". Very satisfactory results were obtained from motors testing between "Fair" and "Good", while rather indifferent results were obtained from those cars testing below "Medium".

The test is made easily. The device is provided with two cables, and either one may be utilized in connection to the magneto terminal. The remaining lead is grounded. The motor is started, operated as slowly as possible without skipping and the position of the needle of the tester noted. It should indicate "Poor" and "Fair" when the motor is raced for a minute. The

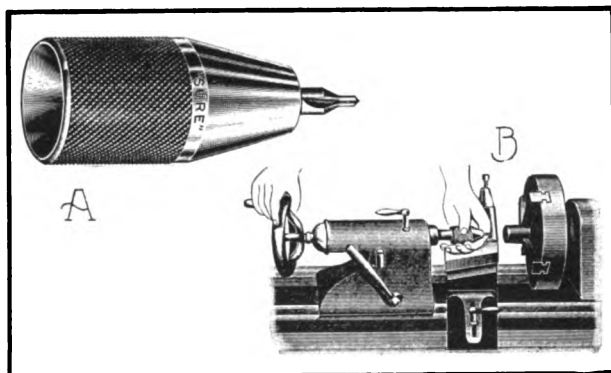
quality of the current at predetermined speeds is read easily on the dial, enabling the workman to tell at a glance the condition of the magneto. The Hoyt Ford magneto tester is moderately priced and should prove especially useful to Ford service stations and all repair shops catering to Ford owners.

### GENTER'S METALLIZED PAINT.

The J. H. Genter Company, Inc., Newburgh, N. Y., is marketing a metallized glass paint which is intended to withstand extreme high temperatures. It is stated that the three shades of copper will successfully survive a heat of 900 degrees Fahrenheit, and at the other end of the scale come black, brown and red, which, it is claimed, will remain unaffected under a heat of 2200 degrees.

### SURE CENTRE FINDER.

The West Haven Manufacturing Company, New Haven, Conn., is producing the Sure centre finder, a new lathe tool, shown in an accompanying illustration. It has a socket that fits on the 60-degree angle taper of centre in the tail stock of the lathe, and when held in that position and fed up to the work held and revolving in the chuck, it immediately locates the centre. The friction of the centre finder on the lathe centre is sufficient to hold for drilling and countersinking, enabling the workman to make the three operations without change or use of any other tool. The fingers need do little more than steady the tool. Each centre finder is sent out with a combination drill and countersink, which are stock sizes with many makers. The Nos. 0 and 1 have a short single-end drill and countersink about



West Haven Sure Centre Finder: A, the Finder; B, Method of Use.

half the length of the double-end ones on the market, for the sake of compactness, but the double-end ones may be used however.



## THE REPAIR SHOP AND GARAGE.

### Turning Up a Four-Throw Crankshaft in the Lathe by Means of Combination Lathe Dogs---How the Bearings Are Finished.

**I**N THE event of a broken crankshaft the usual method is to obtain a new one from the factory, but if the car is an old one and a new part

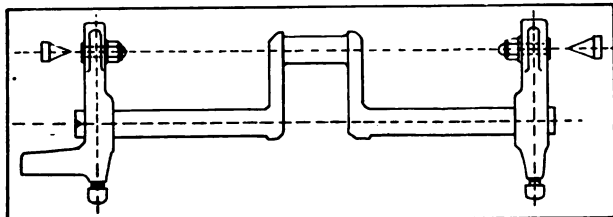


Fig. 1—Using Combination Lathe Dogs for Turning up Crankshaft.

cannot be secured it may be necessary to buy a drop forged crank in the rough and turn it up. Sometimes in the overhaul it is found that the crankpin is worn oval and will not yield to ordinary methods, and when such is the case a light cut is taken. The Strasburger Manufacturing Company, 326 Madison street, Chicago, is marketing combination lathe dogs, which are shown at Fig. 2, and these members are adjustable from two to six inches. They are designed for holding all kinds of crankshafts, such as utilized in automobile and marine engines, and other power plants, and can be employed wherever a common lathe dog can be used.

The design illustrated at C is adapted for turning heavy work, such as motor truck engine crankshafts, and is adjustable from two to eight inches. It is provided with a screw feed centre and gauge, and each type of dog is constructed of the best malleable iron with case hardened steel screws.

The company points out that the turning up of a crankshaft has always been accomplished under certain difficulties except in shops where they are made in large numbers, and where special machines are required. As crankshafts are now forged in nearly all sizes and forms, and may be procured at a reasonable cost in the rough, it is possible to turn these up in the lathe by the following process:

Assuming that a four-throw crankshaft is to be finished, although single and double ones are more common to the repairman: The first step is to centre the work, either by laying off and centring in the drill press or in the lathe with the use of a steady rest. The driving dog is fastened

at one end and the work placed between centres.

The bearings, front, centre and rear, are roughened down to within .03125 or .0625 inch of the finished size. The straight or tailless dog is then fastened on the other end and one-half of the stroke is measured from the centre of the crank to the centre hole in the adjustable screws, and the nuts securely tightened. The work is then placed between the adjustable centres and lined up parallel by running the lathe carriage back and forth.

The second and third pins should be roughened down to within .03125 or .0625 inch of the finished size. The dogs should now be loosened and the crank given half a turn, the first and fourth pins lined up parallel, and finished to exact size. After this is done the dogs are again loosened and the crank given half a turn back and lined up parallel to finish the second and third pins to exact size.

The four pins are now finished to size, so the straight dog and the counter-balance should be taken off, and the crank placed between centres. The centre bearing is then finished to size and the steady rest applied, while the front and rear bearings are being finished to size. Care should be taken not to have the tailstock centre too tight during the finishing cuts.

The large face plate should be used for this operation and a weight clamped to it for a counter-balance. If the crank should have a flange on one end, it may be chucked and a four-jaw chuck used instead of the face-plate, then only one dog will be necessary. If a heavy cut be de-

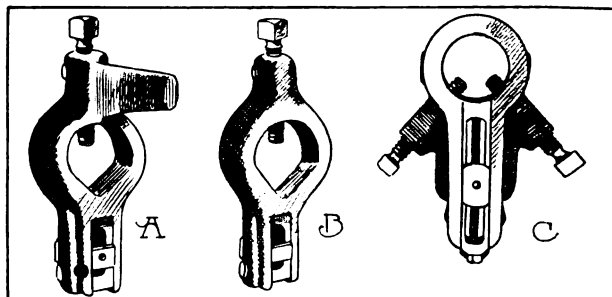


Fig. 2—A and B, Adjustable Combination Lathe Dogs; C, Design for Heavy Work.

sired or the tool should chatter, the steady rest can be used on one pin, while the other pin is being turned down.



## BAILEY ELECTRIC'S BOSTON-CHICAGO TRIP.

**D**ETAILS of the trip from Boston to Chicago, recently completed by Col. E. W. M. Bailey of S. R. Bailey & Co., Amesbury, Mass., in the Bailey electric roadster, No. 1313, indicates in no mistaken terms the availability of this type of vehicle for long distance driving. It will be remembered that this is the same car which Col. Bailey drove from Boston to Burlington, Vt., in order to attend the convention of the New England Section, National Electric Light Association, and return to Boston through New Hampshire, making a round trip of 566 miles. The car, like all Bailey cars, is equipped with the Edison storage battery, made by the Edison Storage Battery Company, Orange, N. J.

From Boston Col. Bailey drove through Worcester to Springfield, against a strong head wind. The run to New Haven, where a night stop was made by request, was at the rate of 23.5 miles an hour. The run to New York from New Haven was made on one charge, and averaged a little better than 20 miles an hour. The total distance, 239 miles, was covered in 11:08:00, running time, or at an average of 21.5 miles an hour.

At the conclusion of the stop in New York, for attendance upon the electrical exhibition, the weather conditions changed very materially. In spite of this and the heavy roads, the first day's run to Albany was made with a rather long boost at Poughkeepsie. The car was put on charge at Albany that night, or rather it was put in a garage with the intention of having it charged, but the next morning it was found that nothing had been done. It was transferred to the electric light company's plant, but as it was impossible to obtain a high rate of charge, practically a day was lost, only 18 miles being covered to Schenectady.

Oct. 21 the trip was continued up the Mohawk valley against a strong head wind, to Syracuse, with a boost at Utica. Wednesday, the weather was fair during the day, but light rain was experienced late in the afternoon. Buffalo was reached after dark. Partial charges were taken at Geneva and Rochester, and the average speed for the day figured out at 21 miles an hour.

At Buffalo, half a day was spent on special business. With the exception of the first 10 miles out of the city, the roads were very bad; mostly gravel, said to be very good in dry weather, but certainly not good under the influence of a week's rain. Erie was reached after a boost midway at Dunkirk. Friday morning it was raining harder

than ever. The start was made late on account of somewhat weak charging facilities, and the roads were the worst yet encountered. Several deep river bottoms were negotiated by means of steep descents and ascents through the clay banks. Ashtabula was reached too late to permit of securing the full charge required, though most generous service was rendered by the local service station manager. The charge had to be continued the next morning and the run to Cleveland was made during the afternoon.

In Cleveland a stop was made over Sunday for rest and to secure road information. This was not encouraging, as Col. Bailey was informed of one stretch in which a good gasoline car had been able to make but 40 miles in nine hours. Nevertheless, a run of 61 miles to Norwalk, O., was made over this route, and after a boost, a short evening run brought the electric to Fremont, still in the rain.

Tuesday, the run to Toledo was over good,

### DAILY RECORD OF THE TRIP.

| Oct.    | Boston to        | Miles | Boosts at          |
|---------|------------------|-------|--------------------|
| 14..... | New Haven, Conn. | 161.0 | Springfield, Mass. |
| 15..... | New York City    | 78.0  | none               |
| 19..... | Albany, N. Y.    | 150.3 | Poughkeepsie       |
| 20..... | Schenectady      | 18.0  | none               |
| 21..... | Syracuse         | 129.8 | Utica              |
| 22..... | Buffalo          | 173.5 | Geneva, Rochester  |
| 23..... | Erie, Penn.      | 104.3 | Dunkirk, N. Y.     |
| 24..... | Ashtabula, O.    | 45.0  | none               |
| 25..... | Cleveland, O.    | 59.6  | none               |
| 27..... | Fremont          | 85.0  | Norwalk            |
| 28..... | Wauseon, Ind.    | 72.0  | Toledo, O.         |
| 29..... | Kendalville      | 85.0  | Archbold           |
| 30..... | South Bend       | 60.2  | none               |
| 31..... | Chicago, Ill.    | 102.0 | Laporte, Ind.      |

but quite worn macadam. A fairly good charge was taken there. The macadam turned to clay and sand some 10 miles out of the city, and the night was spent at Wauseon. A boost was taken at Archbold and, over somewhat better roads in Indiana, Wednesday night found Col. Bailey in Kendalville, from which point he telegraphed that the worst appeared to be over. He was wrong, however, for Thursday morning the rain turned to snow, which again turned to rain. South Bend was reached quite early, but too late to charge and run through.

Friday, there was encountered, between South Bend and Laporte, nearly the heaviest road of the run, so a boost was taken at the latter point. The run to Chicago was then made over good road.

The trip was completed without accident to the car, or failure of any part. The machine was mired four times, but came out under its own power except in one instance.







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## DETAILED SPECIFICATIONS OF 1914 MOTOR

| Make            | Type       | H. P. | Bore | Stroke | G. Ratio | Drive  | Intake Valve | Carburetor | Gals. Gas | Magneto   |
|-----------------|------------|-------|------|--------|----------|--------|--------------|------------|-----------|-----------|
| A-M-C           | single     | 4     | 3.25 | 3.67   | 4.25-1   | belt   | automatic    | Schebler   | 3         | Berling   |
| A-M-C           | single     | 4     | 3.25 | 3.67   | 5.66-1   | chain  | automatic    | Schebler   | 3         | Berling   |
| A-M-C           | twin       | 7-9   | 3.25 | 3.67   | 4.25-1   | belt   | mechanical   | Schebler   | 3         | Berling   |
| A-M-C           | twin       | 7-9   | 3.25 | 3.67   | 4.5-1    | chain  | mechanical   | Schebler   | 3         | Berling   |
| Black Hawk      | single     | 4     | 3.25 | 3.67   | 5-1      | option | mechanical   | Schebler   | 2         | Bosch     |
| Black Hawk      | twin       | 10    | 3.37 | 3.87   | 3.75-1   | chain  | overhead     | Schebler   | 3         | Bosch     |
| Dayton          | twin       | 7     | 3.25 | 3.67   | 3.75-1   | chain  | overhead     | Schebler   | 2½        | Bosch     |
| Dayton          | twin       | 9     | 3.50 | 3.67   | 3.75-1   | chain  | mechanical   | Schebler   | 2½        | Bosch     |
| Emblem          | single     | 5     | 3.50 | 4.00   | 4.5-1    | option | mechanical   | Emblem     | 2         | battery   |
| Emblem          | single     | 5     | 3.50 | 4.00   | 4.5-1    | option | mechanical   | Emblem     | 2         | Herz      |
| Emblem          | twin       | 8     | 3.37 | 3.75   | 3.5-1    | chain  | mechanical   | Emblem     | 2         | Herz      |
| Emblem          | twin       | 10    | 3.50 | 4.00   | 3.5-1    | chain  | mechanical   | Emblem     | 2         | Herz      |
| Excelsior       | single     | 4-6   | 3.32 | 3.50   | 5-1      | option | overhead     | Schebler   | 2½        | Bosch     |
| Excelsior       | single     | 4-6   | 3.32 | 3.50   | 3.87-1   | chain  | overhead     | Schebler   | 2½        | Bosch     |
| Excelsior       | twin       | 7-10  | 3.32 | 3.50   | 4-1      | chain  | overhead     | Schebler   | 2½        | Bosch     |
| Excelsior       | twin       | 7-10  | 3.32 | 3.50   | 3.62-1   | chain  | overhead     | Schebler   | 2½        | Bosch     |
| Fellbach        | single     | 5     | 3.31 | 4.00   | 3.5-1    | chain  | mechanical   | Schebler   | 1½        | Berling   |
| Fellbach        | twin       | 10    | 3.31 | 4.00   | 4-1      | chain  | mechanical   | Schebler   | 2         | Berling   |
| Fellbach        | twin       | 10    | 3.31 | 4.00   | 3-1      | shaft  | mechanical   | Schebler   | 2         | Berling   |
| Flying Merkel   | single     | 4     | 3.25 | 3.67   | 4.5-1    | option | mechanical   | Merkel     | 2½        | Bosch     |
| Flying Merkel   | twin       | 7     | 3.25 | 3.67   | 3.96-1   | option | mechanical   | Merkel     | 2½        | Bosch     |
| Flying Merkel   | twin*      | 7     | 3.25 | 3.67   | 3.96-1   | chain  | mechanical   | Merkel     | 2½        | Bosch     |
| Harley-Davidson | single     | 5     | 3.31 | 4.00   | ....     | belt   | overhead     | Schebler   | 1½        | Bosch     |
| Harley-Davidson | single     | 5     | 3.31 | 4.00   | ....     | chain  | overhead     | Schebler   | 1½        | Bosch     |
| Harley-Davidson | single     | 5     | 3.31 | 4.00   | ....     | chain  | overhead     | Schebler   | 1½        | Bosch     |
| Harley-Davidson | twin       | 8     | 3.31 | 3.50   | ....     | chain  | overhead     | Schebler   | 2½        | Bosch     |
| Harley-Davidson | twin       | 8     | 3.31 | 3.50   | ....     | chain  | overhead     | Schebler   | 2½        | Bosch     |
| Henderson       | 4-cylinder | 8     | 2.62 | 3.00   | 4.25-1   | chain  | mechanical   | Schebler   | 3         | Splitdorf |
| Henderson       | 4-cylinder | 8     | 2.62 | 3.00   | 4-1      | chain  | mechanical   | Schebler   | 3         | Splitdorf |
| Indian          | single     | 4     | 3.25 | 3.67   | 5.25-1   | chain  | mechanical   | Indian     | 2½        | Splitdorf |
| Indian          | twin       | 7     | 3.25 | 3.67   | 4-1      | chain  | mechanical   | Indian     | 2½        | Splitdorf |
| Indian          | twin       | 7     | 3.25 | 3.67   | 4-1      | chain  | mechanical   | Indian     | 2½        | Splitdorf |
| Indian          | twin       | 7     | 3.25 | 3.67   | 3.47-1   | chain  | mechanical   | Indian     | 2½        | Splitdorf |
| Indian          | twin       | 7     | 3.25 | 3.67   | 3.47-1   | chain  | mechanical   | Indian     | 2½        | Splitdorf |
| Indian          | twin†      | 7     | 3.25 | 3.67   | 3.47-1   | chain  | mechanical   | Indian     | 2½        | battery   |
| Iver Johnson    | single     | 4     | 3.25 | 3.75   | 4.3-1    | chain  | mechanical   | Schebler   | 2½        | Bosch     |
| Iver Johnson    | single     | 4     | 3.25 | 4.25   | 3.75-1   | chain  | mechanical   | Schebler   | 2         | Bosch     |
| Iver Johnson    | twin       | 7.5   | 3.25 | 3.75   | 3.75-1   | chain  | mechanical   | Schebler   | 2½        | Bosch     |
| Jefferson       | single     | 4     | 3.37 | 3.40   | 4.5-1    | chain  | overhead     | Heltger    | 2½        | Bosch     |
| Jefferson       | twin       | 7     | 3.37 | 3.40   | 3.5-1    | chain  | overhead     | Heltger    | 2½        | Bosch     |
| Minneapolis     | single     | 4-5   | 3.37 | 4.00   | ....     | chain  | overhead     | Schebler   | 2         | Bosch     |
| Minneapolis     | twin       | 10    | 3.37 | 4.00   | ....     | chain  | overhead     | Schebler   | 2         | Bosch     |
| Pirate          | single     | 5-6   | 3.31 | 4.00   | 5-1      | chain  | mechanical   | Heltger    | 2½        | option    |
| Pirate          | twin       | 9-10  | 3.31 | 4.00   | 5-1      | chain  | mechanical   | Heltger    | 2½        | option    |
| Pope            | single     | 4     | 3.00 | 3.68   | 4.3-1    | belt   | mechanical   | Schebler   | 2         | Herz      |
| Pope            | single     | 4     | 3.32 | 3.50   | 4.6-1    | belt   | mechanical   | Schebler   | 2         | Herz      |
| Pope            | single     | 5     | 3.62 | 3.68   | 4-1      | chain  | mechanical   | Schebler   | 2         | Bosch     |
| Pope            | twin       | 7-8   | 3.32 | 3.50   | 4-1      | chain  | mechanical   | Schebler   | 3         | Bosch     |
| Schickel        | single     | 5     | 3.37 | 3.37   | 3.5-1    | belt   | valveless    | Krice      | 3         | Berling   |
| Schickel        | single     | 5     | 3.37 | 3.37   | 5.8-1    | chain  | valveless    | Krice      | 3         | Berling   |
| Schickel        | single     | 6     | 4.00 | 3.37   | 3.5-1    | belt   | valveless    | Krice      | 3         | Berling   |
| Schickel        | single     | 6     | 4.00 | 3.37   | 5.8-1    | chain  | valveless    | Krice      | 3         | Berling   |
| Thor            | single     | 4     | 3.25 | 3.60   | ....     | chain  | mechanical   | Thor       | 2½        | Bosch     |
| Thor            | single     | 5     | 3.57 | 3.80   | ....     | chain  | mechanical   | Thor       | 2½        | Bosch     |
| Thor            | twin       | 7     | 3.25 | 3.60   | ....     | chain  | mechanical   | Thor       | 2½        | Bosch     |
| Thor            | twin       | 9     | 3.57 | 3.80   | ....     | chain  | mechanical   | Thor       | 3         | Bosch     |
| Yale            | single     | 5-6   | 3.37 | 3.67   | 4.5-1    | chain  | mechanical   | Schebler   | 3         | Bosch     |
| Yale            | twin       | 7-8   | 3.25 | 3.67   | 3.75-1   | chain  | mechanical   | Schebler   | 3         | Bosch     |

\*Mechanical starter; †electric starter.

tise. New cams of smaller size are fitted, and the intake valve tappets are provided with cushion springs. The overhead rocker arms are heavier in design, and the lift rods are set in inverted sockets. Lubrication is automatic, controlled by throttle.

#### Electrically Equipped Indian.

At first glance, it would appear from the accompanying table that the Hendee Manufacturing Company, Springfield, Mass., had returned to the production of battery models, something which was dropped by the Indian maker a matter of two years ago. More extended study of the

situation reveals the fact that the battery model listed is really an advance step in motorcycle production. This machine, which is to be the leader during 1914, is termed an electrically equipped Indian, and will be known as the Hendee Special. The electric starter comprises a compact motor-generator mounted in about the same position as the Indian foot starter on the other models. The generator supplies current for charging the storage batteries, which in turn supply for ignition, starting the motor and running a headlight. Several changes are incorporated in the motor and frame, but space will not permit of an extended



## CYCLES REVEALED AT CHICAGO SHOW.

| Lubrication   | Qts. Oil | Forks           | Brake      | Control     | Wheelbase | Tires | Clutch     | Price |
|---------------|----------|-----------------|------------|-------------|-----------|-------|------------|-------|
| automatic     | 3        | spiral spring   | Musselman  | double grip | 59        | 28x2½ | Eclipse    | \$220 |
| automatic     | 3        | spiral spring   | Musselman  | double grip | 59        | 28x2½ | Eclipse    | 245   |
| automatic     | 3        | spiral spring   | Musselman  | double grip | 59        | 29x2½ | Eclipse    | 260   |
| automatic     | 3        | spiral spring   | Musselman  | double grip | 59        | 29x2½ | Eclipse    | 285   |
| mechanical    | 2        | spring plunger  | Black Hawk | double grip | 53        | 28x2½ | Black Hawk | 215   |
| mechanical    | 4        | spring plunger  | Black Hawk | double grip | 60        | 28x2½ | Black Hawk | 275   |
| sight feed    | 2        | rocker          | Davis      | grip        | 57        | 28x3  | Eclipse    | 265   |
| sight feed    | 2        | rocker          | Davis      | grip        | 57        | 28x3  | Eclipse    | 275   |
| sight feed    | 2        | cushion         | Corbin     | grip        | 56        | 28x2½ | Eclipse    | 175   |
| sight feed    | 2        | cushion         | Corbin     | grip        | 56        | 28x2½ | Eclipse    | 200   |
| sight feed    | 2        | cushion         | Corbin     | grip        | 56        | 28x2½ | Eclipse    | 250   |
| sight feed    | 2        | cushion         | Corbin     | grip        | 56        | 28x2½ | Eclipse    | 300   |
| sight feed    | 1½       | leaf spring     | .....      | double grip | 57        | 28x2½ | Eclipse    | ...   |
| sight feed    | 1½       | leaf spring     | .....      | grip, lever | 57        | ....  | Eclipse    | ...   |
| sight feed    | 4½       | leaf spring     | .....      | double grip | 57        | 28x3  | Eclipse    | ...   |
| sight feed    | 4½       | leaf spring     | .....      | grip, lever | 57        | 28x3  | Eclipse    | ...   |
| automatic     | 1        | truss, spring   | Corbin     | grip        | 59        | 28x2½ | Eclipse    | 240   |
| automatic     | 1        | truss, spring   | Corbin     | grip        | 60        | 28x3  | Eclipse    | 290   |
| automatic     | 1        | truss, spring   | band       | grip        | 60        | 28x3  | cone       | 325   |
| automatic     | 2        | truss, spring   | Musselman  | grip, lever | 55        | 28x2½ | Eclipse    | 210   |
| automatic     | 2        | truss, spring   | Musselman  | grip, lever | 55        | 28x2½ | Eclipse    | 260   |
| automatic     | 2        | truss, spring   | Musselman  | grip, lever | 55        | 28x2½ | Eclipse    | 310   |
| semi-auto.    | 3½       | coil spring     | band       | double grip | 57        | 28x3  | disc       | 200   |
| semi-auto.    | 3½       | coil spring     | band       | double grip | 57        | 28x3  | disc       | 210   |
| semi-auto.    | 3½       | coil spring     | band       | double grip | 57        | 28x3  | disc       | 245   |
| semi-auto.    | 2        | coil spring     | band       | double grip | 58        | 28x3  | disc       | 250   |
| semi-auto.    | 2        | coil spring     | band       | double grip | 58        | 28x3  | disc       | 285   |
| s. f., splash | 2        | spring plunger  | band       | grip        | 65        | 28x3  | disc       | 325   |
| s. f., splash | 2        | spring plunger  | band       | grip        | 65        | 28x3  | disc       | 365   |
| mechanical    | 2        | leaf spring     | Corbin     | double grip | 55        | 28x2½ | Indian     | 200   |
| mechanical    | 2        | leaf spring     | Corbin     | double grip | 58        | 28x3  | Indian     | 225   |
| mechanical    | 2        | leaf spring     | Corbin     | double grip | 58        | 28x3  | Indian     | 260   |
| mechanical    | 2        | leaf spring     | Indian     | double grip | 58        | 28x3  | Indian     | 275   |
| mechanical    | 2        | leaf spring     | Indian     | double grip | 58        | 28x3  | Indian     | 300   |
| mechanical    | 2        | leaf spring     | Indian     | double grip | 58        | 28x3  | Indian     | 325   |
| hand pump     | 2½       | spring          | Corbin     | grip        | 56        | 28x2½ | friction   | 200   |
| hand pump     | 2½       | spring          | Corbin     | grip        | 56        | 28x2½ | .....      | 225   |
| hand pump     | 2        | spring          | Corbin     | grip        | 56        | 28x2½ | .....      | 275   |
| mechanical    | 2        | leaf spring     | Corbin     | wire        | 57.5      | 29x2½ | Eclipse    | 215   |
| mechanical    | 2        | leaf spring     | Corbin     | wire        | 57.5      | 29x2½ | Eclipse    | 260   |
| f. f., splash | ..       | .....           | band       | double grip | ..        | 28x3  | disc       | 275   |
| f. f., splash | ..       | .....           | band       | double grip | ..        | 28x3  | disc       | 325   |
| splash        | 3        | Sager           | Eclipse    | grip        | 58        | 28x2½ | Eclipse    | 285   |
| splash        | 3        | Sager           | Eclipse    | grip        | 58        | 28x3  | Eclipse    | 275   |
| mechanical    | 3        | leaf spring     | Eclipse    | grip        | 51        | 26x2½ | Eclipse    | 150   |
| mechanical    | 2        | leaf spring     | Eclipse    | double grip | 56        | 28x2½ | Eclipse    | 200   |
| mechanical    | 2        | leaf spring     | Corbin     | grip        | 56.5      | 28x2½ | Eclipse    | 215   |
| mechanical    | 2        | leaf spring     | Corbin     | grip        | 56.5      | 28x2½ | Eclipse    | 250   |
| two-cycle     | ..       | coil spring     | Corbin     | grip        | 57        | 29x2½ | Eclipse    | 220   |
| two-cycle     | ..       | coil spring     | Corbin     | grip        | 57        | 28x2½ | Eclipse    | 225   |
| two-cycle     | ..       | coil spring     | Corbin     | grip        | 57        | 29x2½ | Eclipse    | 235   |
| two-cycle     | ..       | coil spring     | Corbin     | grip        | 57        | 28x2½ | Eclipse    | 240   |
| mechanical    | 4        | spring          | Thor       | grip        | 58        | 28x2½ | Thor       | ...   |
| mechanical    | 4        | spring          | Thor       | grip        | 58        | 29x2½ | Thor       | ...   |
| mechanical    | 4        | spring          | Thor       | grip        | 58        | 29x2½ | Thor       | ...   |
| mechanical    | 6        | spring          | Thor       | grip        | 58        | 28x3  | Thor       | ...   |
| mechanical    | 4        | compound spring | Corbin     | double grip | 57.5      | 28x3  | .....      | 235   |
| mechanical    | 4        | compound spring | Corbin     | double grip | 57.5      | 28x3  | .....      | 285   |

description of the several models at this time.

#### Black Hawk.

There is practically no change in the single-cylinder Black Hawk, made by the Black Hawk Motor Company, Rock Island, Ill. The twin is new, and no details concerning it were made public previous to the opening of the show.

#### Harley-Davidson.

Changes in the line produced by the Harley-Davidson Motor Company, Milwaukee, Wis., include the following: Foot starter on all chain models, enclosed exhaust valve springs, priming cups and priming guns fitted, improved carburet-

or, adjustable compression relief rod, improved grip control, internal expanding band brake on chain models, contracting band brake on belt models, collapsible footboards, double clutch control, etc.

#### Dayton Models.

The Davis Sewing Machine Company, Dayton, O., presents its two twin Dayton models for the second season with a new three-stem spring fork, which is of the hinged type, the resilience being obtained by the use of leaf springs. The fork is designed to absorb both horizontal and vertical shocks. The line also is fitted with



a new band brake with double control, aluminum footboards and tubular luggage carrier.

#### **New Thor Twin.**

The Aurora Automatic Machinery Company, Aurora, Ill., is producing an entirely new Thor twin, while the changes in the other models are largely in the nature of minor refinements. The new Twin is distinctly a Thor product, however, but is fitted with a multiple disc clutch that differs somewhat from the others.

#### **Three Emblems.**

Although the table indicates that the Emblem Manufacturing Company, Angola, N. Y., is producing four models of the Emblem, this is explained by the fact that the single is fitted with either battery or magneto ignition, with a corresponding difference in price. The changes are

chine, with the pedal chain on the left, the advantage being in the placing of the clutch operating lever on the right. In other particulars the design corresponds with the twin.

#### **Henderson Four-Cylinder.**

The Henderson Motorcycle Company, Detroit, presents a new two-speed model, which is practically a duplicate of the regular model, save for the addition of a Thor two-speed gearset, which attaches to the rear axle. Mention already has been made of the hand cranking device.

#### **Minneapolis Models New.**

The Minneapolis line, produced by the Minneapolis Motor Company, Minneapolis, Minn., is new throughout. New motors of the firm's own design replace the De Luxe engines, and all models are fitted with the new kick starter. The features are the unit power plant with long stroke motor, two-speed gears on all models, multiple disc clutch operating in oil, double grip control, broad and strong mudguards.

#### **Schickel and Pope.**

There are few important changes in the Schickel line, made by the Schickel Motor Company, Stamford, Conn., which is characterized by the use of a two-cycle motor. Among the additions are: Spring mounted foot rests, hinged mudguards, a slight change in method of controlling the idler pulley on the belt driven machines, etc.

The Pope Manufacturing Company, Hartford, Conn., announces but few changes in the Pope for 1914. Practically no

changes are noted in the smaller models, but in the larger there are several minor refinements, included among which may be mentioned the following: Lighter pistons, frame strengthened by the use of fishtail reinforcements from the head, new exhaust pipe, oil tank narrower for chain clearance, and the addition of foot rests.

#### **Other Models Listed.**

The main features of all the models shown are presented in the accompanying table, and in addition to those to which special reference has been made above, the following makers are represented: Allied Motor Corporation, Chicago, A-M-C; Excelsior Motor Manufacturing & Supply Company, Chicago, Excelsior; Feilbach Mo-



Typical of the Individual Stands at the Chicago Show, with the Flying Merkel in the Foreground.

not numerous and consist mainly in the fitting of a new and heavier front spring fork, foot rests and a double brake control.

#### **Changes in Yale.**

The Consolidated Manufacturing Company, Toledo, O., presents a number of changes in the Yale, chief among which may be mentioned: New planetary countershaft two-speed gear, new exhaust valve springs, enclosed inlet valve mechanism and heavier frame.

#### **Iver Johnson.**

The chain driven Iver Johnson single, made by the Iver Johnson Arms & Cycle Works, Fitchburg, Mass., is new, but presents practically the same features as the other models of the line. The drive chain is on the right side of the ma-



tor Company, Milwaukee, Wis., Feilbach; Waverley Manufacturing Company, Jefferson, Wis., Jefferson.

#### The Show Itself.

Early reports from the show indicate that it was an even greater business success than the first display of this character held in the same city last February. Large delegations of dealers from all sections of the Middle West and Southwest began arriving two days before the show actually opened. Practically all of the manufacturers reserved presentation of their new lines until the doors were opened. As a result there followed a busy week for both manufacturers and dealers, and numerous contracts were signed. There seems little doubt that the separate motorcycle exhibition, conducted by the manufacturers themselves, is of distinctly greater benefit to the industry as a whole, insofar as Chicago is concerned, at least, than an attempt to reach the dealers and riders through a corner display in the annual automobile show.

#### Merkel in Militia Service.

Corp. H. B. Monninger, Company B, Indiana National Guard, demonstrated a new practical use for the Flying Merkel motorcycle, made by the Miami Cycle & Manufacturing Company, Middletown, O., when he received word at 3 in the morning, to round up his company to proceed at once to quell the recent strike rioting in Indianapolis. Corp. Monninger covered 62 miles in accomplishing his task and finished before 6 in the morning, in time to catch the first morning train. The machine utilized was a 1911 model, which has seen over 20,000 miles of continuous service.

#### Bosch at the Show.

A. H. Bartsch, advertising manager of the Bosch Magneto Company, New York City, writes from Chicago, that he counted the magneto equipment of the 139 motorcycles exhibited, and found that 70 per cent. were fitted with Bosch ignition, the balance being divided between three other makes. Of course, this is very gratifying to the company which he represents, and indicates the preference of the motorcycle manufacturers in this respect.

#### New Members for October.

Secretary-Treasurer G. B. Gibson of the Federation of American Motorcyclists reports 261 new members during the month of October, these being divided according to states, as follows: Ohio, 42; Indiana, 31; California, 22; New York, 21; Massachusetts, 19; Illinois, 16; Kansas, 15; South Dakota, 11; Rhode Island, nine; New Jersey, nine; Pennsylvania, nine; Oregon, nine;

Wisconsin, eight; Virginia, seven; Missouri, four; Iowa, four; Connecticut, three; New Hampshire, three; Texas, three; Michigan, three; West Virginia, three; Maryland, two; Georgia, two; Vermont, District of Columbia, South Carolina, Tennessee, Minnesota, Nebraska, one each.

#### Harley-Davidson Boston Branch.

W. J. Walker, manager of the New England branch of the Harley-Davidson Motor Company, Danvers, Mass., has sold his hardware business to Charles Orcutt and Stafford Hennigar, who will handle hardware and motorcycles, Mr. Hennigar taking care of the latter and Mr. Orcutt the former. Mr. Walker will devote his whole time to the interests of the Harley-Davidson Motor Company and is moving the branch to Boston, where wholesale and retail business offices will be opened in December at 74 Huntington avenue.

#### Big Day for Merkel.

Just by way of indicating that business is picking up at the factory of the Miami Cycle & Manufacturing Company, Middletown, O., F. L. Valiant reports that in one day recently orders were received for the following: Flying Merkel motorcycles, 451; Flying Merkel bicycles, 251; Racycles, 523; Hudsons, 102; jobbing bicycles, 1794; juvenile bicycles, 326; Miami carryalls, 17; Ramis, 239; Musselman coaster brakes, 1031; Miami Bull Dog bicycles, 37. This is said to be the biggest day in the Miami company's history, from the standpoint of number of orders received.

#### Club Notes, Here and There.

The Winsted Motorcycle Club, Winsted, Conn., has been formed and the following officers elected: President, Raymond D. Allen; vice president, James F. Ryan; secretary and treasurer, W. S. Fancher.

In the South Bend run of the South Shore Motorcycle Club, Chicago, Ill., seven of the riders finished with perfect scores.

The West Philadelphia Motorcycle Club, Philadelphia, Penn., organized in November, 1912, is to hold its first anniversary banquet this month.

The New York division of the Century Road Club Association will hold its annual reception and ball at the Plaza assembly rooms, New York City, Dec. 30.

The Twin City Motorcycle Club, Texarkana, Tex., has been formed and the following officers elected: President, Charles A. Hooks; secretary, William Watlington; captain, M. B. Chandler.

### JOIN THE F. A. M.

which is the National Organization fostering the interests of motorcyclists along legislative and other lines. Cut this out, mail it, and you will get the reasons.

#### E. M. ESTABROOK

Chairman Membership Committee Federation  
American Motorcyclists,  
BANGOR, MAINE.

Please send me the F. A. M. Booklet and all information interesting to prospective members.

Name .....

Address .....



# NEWS OF THE MANUFACTURER AND DEALER.

The following concerns have been incorporated recently to manufacture or deal in motor cars, accessories, etc.:

**Detroit Turbine Manufacturing Company**, Detroit; \$50,000; to manufacture gasoline engines, accessories, etc.; James F. Mylon, George E. Gowing, Peter H. F. Spies.

**Hawk Motor Car Company**, Detroit; \$50,000; to manufacture a cyclecar; F. S. Salter, Duane Tibbitts, W. W. McIntyre.

**American Motor Wheel Company**, Crawfordsville, Ind.; \$600,000; to manufacture automobile wheels; W. H. Orren, S. C. Rowland, John V. Willson.

**Cameron Manufacturing Company**, Orange, N. J.; \$1,000,000; to manufacture and deal in motor vehicles and boats; F. S. Corlew, T. M. Steele, H. F. Parmelee.

**Kalamazoo Motor Vehicle Company**, Kalamazoo, Mich.; \$35,000; Frank G. Clark and others.

**S. S. Gay Company**, Ottawa, Can.; \$200,000; to manufacture motor vehicles, carriages, etc.; Simeon G. Gay, Chester T. Bangs, L. W. Nichols.

**Rail & Auto Sundries Company**, Chicago; \$5000; to manufacture and sell motors of all kinds, railway and auto supplies and accessories; William W. Bishop, Raphael B. Jamison, William J. Anderson.

**Onelda Motor Car Company**, Onelda, N. Y.; \$10,000; to manufacture auto trucks.

**Oakbrook Motor Manufacturing Company**, Wilming-

Jose, Cal.; \$25,000; W. E. Whitmore, N. E. Chirdaoline, Clare St. John, A. W. Morey, V. A. Scheller, board of directors for first year.

**Palmer & Slinger Motor Company of New England**, Boston, Mass.; \$25,000; president, E. A. McGrath, treasurer, Joseph M. Hurley, 60 Fenway; T. F. Hurley.

**Clintwood Motor Company**, Clintwood, Va.; \$10,000; secretary, B. D. French.

**Imperial Motor Company**, Boston, Mass.; \$15,000; Frank P. Anthony, Henry U. Rogers, Roland Bailey.

**Kaukey-Mysing Automobile Company**, Laurel, Miss.; \$10,000.

**Buttola Manufacturing Company**, New York City; \$450,000; to manufacture and deal in all kinds of oils; Leo Mandelstamm, Fannie Mandelstamm, Samuel N. Freedman, 55 Liberty street.

**Schildwachter Automobile Company**, New York City; \$30,000; automobiles and supplies; A. Sanderson, K. R. Norton, M. Schurman.

## WITH THE MANUFACTURER.

**The Harris Bros. Company**, Chicago, Ill., bid in at the receiver's sale the entire assets of the Cutting Motor Car Company, Jackson, Mich., for \$35,000. This includes property, merchandise and materials.

**The Emil Grossman Company**, maker of the Red Head spark plug, recently took possession of its new factory in building No. 20, Bush Terminal, Brooklyn, N. Y., which is shown herewith. The machinery heretofore installed in the New York and Detroit factories of the concern has been removed to this plant, in addition to new equipment of the most modern type, and the facilities for the production of Red Head spark plugs have been increased very materially in consequence.

**The Republic Rubber Company's** operatives, Youngstown, O., have elected five of their number to serve on the board of governors of the new club house which will be formally opened in December, as follows: Oscar Watkins, C. A. Miller, Daniel Evans, J. Delter and C. C. Porter. They will serve with three other members, to be appointed by President T. L. Robinson.

**The Pope-Hartford Company**, Boston, Mass., has taken the agency for the Maxwell cars, according to the announcement of Manager F. H. Lucas.

**The Bosch Magneto Company**, New York City, maker of the Bosch magneto, announces the appointment of new distributors as follows: Bertram Motor Supply Company, Salt Lake City, Utah; Schuman Carriage Company, Honolulu, T. H. The following are the new Bosch supply stations recently appointed: T. M. Caldwell, Amarillo, Tex.; Charles Arnholm, Barre, Vt.; A. R. Rettinghouse, Centalla, Ill.; Electric Service Company, Dallas, Tex.; Robert R. Ashwell, Hartford, Conn.; Bering Tire & Rubber Company, Houston, Tex.; Andrew Cowan & Co., Louisville, Ky.; Manley-Wilkins Company, Mt. Carmel, Ill.; Tire Trading Company, Newark, N. J.; J. M. Hubbard & Co., Norfolk, Va.; Tiffany Diamond garage, Poughkeepsie, N. Y.; H. G. Guenther, San Antonio, Tex.; Wyckoff-Cord Auto Company, Sioux City, Ia.; Child, Day & Churchill, Spokane, Wash.; Motor Shop, Trenton, N. J.; Tri-State Supply Company, White Plains, N. Y.; P. N. Montague garage, Winston-Salem, N. C.

**The Metz Company**, Waltham, Mass., maker of the Metz car, is to establish an athletic field for the employees of the plant, which will be equipped so that sports may be enjoyed throughout the entire year.

**The White Company**, Cleveland, O., is building an addition to its motor car paint shop and another, 240 by 30 feet, will be erected to the main building.

**The F. E. Lorts Company**, Cleveland, O., maker of fore doors and coupe bodies, has opened a Chicago distributing branch at 1547 South Michigan avenue.

**The Golden West Motors Company**, Sacramento, Cal.,



**Red Head Spark Plug's New Home in Bush Terminal, Brooklyn, N. Y.**

ton, Del.; \$250,000; W. F. Young, Perklomen, Penn.; A. H. Yocum, Reading, Penn.; S. H. Kochel, East Greenville, Penn.; T. S. Doherty, Wilmington, Del.

**The Auto-Ped Company**, New York City; \$1,000,000; to manufacture motor cars, trucks and boats; Joseph F. Curtin, Clarence E. Eaton.

**Williams Self-Starter Manufacturing Company**, Chicago, Ill.; \$5000; automobile parts.

**Woods Manufacturing Company**, Fairfield, Conn.; to manufacture automobile lamps.

**Grand Center Motor Car Company**, St. Joseph, Mo.; \$5000; W. J. Hendler, H. R. Lewis, Louis Seigel.

**Albertson Company of Philadelphia**, Dover, Del.; \$25,000; automobiles, etc.; George H. B. Martin, Camden, N. J.

**The Marshall Morgan Co-Operative Rubber Tire Company**, East Liverpool, O.; \$500,000

**The Lewiston Manufacturing Company**, Lewiston, Mont.; \$40,000; compound for auto tires.

**Autocrat Manufacturing Company**, Buffalo, N. Y.; \$50,000; motorcycles, sidecars, etc.; F. Maytham, Collins, N. Y.; F. S. Mott, A. W. Plumley.

**Flexible Rim Tire Company**, New York City; \$25,000, tires and motor vehicles; C. E. Clark, E. G. Ofeldt, A. H. Favsur.

**The National Tire & Rubber Company**, East Palestine, O.; \$150,000.

**Miller Inner Tire Core Company**, Washington, D. C.; \$260,000; George B. Rose and others.

**Longwood Automobile Company**, Chicago, Ill.; \$12,000; to deal in automobiles.

**California Garage & Auto Brokerage Company**, San



# NEW DEPARTURE

QUALITY GUARANTEED



AMERICAN MADE FOR AMERICAN TRADE

# BALL BEARINGS

The NEW DEPARTURE MFG. CO.  
BRISTOL CONN.



which will manufacture a commercial car, is to erect a large building in which modern machinery will be installed.

**Bontel & Mackey**, Los Angeles, Cal., body manufacturer, has moved to new quarters at 1953 South Grand avenue.

**The Panama Rubber Company**, Los Angeles, Cal., is to erect a new large building for the manufacture of automobile tires.

**The Mitchell-Lewis Motor Company**, Racine, Wis., is to open a branch at Fairmount, W. Va.

**The Catasauqua Motor Car Works**, Allentown, Penn., will establish a plant on River road for the manufacture of light vehicles.

**The Continental Motor Truck Company**, Denver, Col., is reported to be contemplating the establishment of a branch plant at Waterloo, Ia. Representatives of the company have been in the latter city looking for a favorable site.

**The Joseph Dixon Crucible Company**, Jersey City, N. J., maker of Dixon's graphite lubricants, has been conducting a novel advertising campaign in the New York City territory, in which the automobile shown in an accompanying illustration has played an important part. The machine was in charge of A. G. Thomson, who was assisted by New York Manager John M. Ready and a

burn & Moore Company, has opened a garage on Windsor avenue and will conduct a general automobile business and repair shop.

**Will Radeleft** and **Orval Markles**, Springville, Cal., have formed a partnership and will engage in the automobile repair business.

**J. D. Lauppe**, Sacramento, Cal., has opened a new garage at 1221 K street.

**The Goodman Puncture Proof Tire Company**, Stockton, Cal., has been formed and will install a modern vulcanizing plant. The company is to manufacture a lining for automobile tires.

**The State Center Automobile Company**, State Center, Ia., has been formed and is to erect a garage.

**Mooney's Messenger Service**, Port Huron, Mich., has had preliminary plans prepared for a two-story garage, 100 by 100 feet.

**Horace W. Sellere**, Philadelphia, Penn., will take revised bids on plans and specifications for a garage to be erected at Ardmore, Penn., for James B. Ladd.

**A. W. Lee**, Wheeling, W. Va., is planning an addition to his garage to be used as a repair shop.

**B. F. Virdia**, Philadelphia, Penn., has been awarded the contract for an addition to the garage of S. Kilpinger at 3127 Huntingdon street, at a cost of \$2100.

**The Ohio Auto Sales Company**, Columbus, O., has awarded contracts for the erection of a new office and salesroom at a cost of \$17,000.

**W. & F. Felbert**, Cleveland, O., has been given the permit for the erection of a large garage at 7016 Lake avenue. It will be 80 by 112 feet and will cost \$6000.

**Baldwin Hergenbahn**, Chicago, Ill., has plans and permit for the erection of a new one-story brick garage on Lincoln avenue, to cost \$10,000.

**B. C. Brown** and **F. D. Frazier**, Dufur, Ore., are to build a garage in that city.

**Wilson & Wentrow**, Philadelphia, Penn., are having plans prepared for the erection of a garage and repair shop on 21st street.

**The Atlantic Land Company**, Pittsburg, Penn., is to build a two-story garage, 60 by 251 feet.

**Louis Delmas**, Philadelphia, Penn., is having plans prepared for the erection of a two-story brick garage, 25 by 35 feet.

**R. F. White**, Oxford, Penn., is having plans prepared for the erection of a two-story brick garage.

**Reiff & Leinbach**, Reading, Penn., is preparing to build a two-story garage, 40 by 80 feet.

**James M. Montgomery**, 112 Grant street, Newburgh, N. Y., is planning the erection of a two-story concrete garage, 60 by 125 feet, at a cost of about \$18,000.

**Dr. Samuel C. Blair**, Philadelphia, Penn., has awarded the contract for the erection of a one-story brick garage at 2819 Fletcher street. It will be 91 by 57 feet and cost \$2500.

**Oliver Crosby**, 804 Lincoln avenue, St. Paul, Minn., is planning to build a 2.5-story garage, to accommodate 49 cars, at a cost of \$75,000.

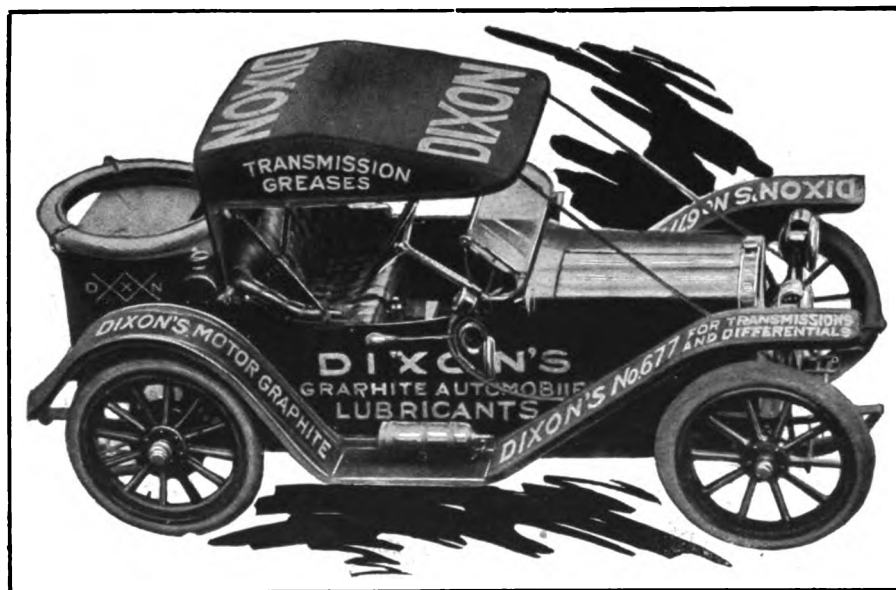
**D. S. Mennasco** was elected president of the American Motors California Company, San Francisco, Cal., at the recent meeting and the other officers elected are: Vice president, Marc Brunnell; treasurer and general manager, F. M. Bowman; secretary, H. M. Street.

**Newton Hale**, Des Moines, Ia., is to have a brick garage erected at Floris, Ia., on the Davis property.

**A. N. Overbaugh**, Renwick, Ia., is to have a public garage erected.

**The Bryant Motor Car Company**, Waterloo, Ia., is to have a garage erected on West Fifth street. It will be 50 feet by 120 feet.

**J. A. Huhn** and **George A. Maro**, Glendora, Cal., are planning to build a garage on Vermont avenue at cost of \$5000.



Machine Utilized by Joseph Dixon Crucible Company in Dispensing Knowledge of Dixon's Graphite Lubricants.

corps of active salesmen. As a result, many automobile users in the Metropolis are better acquainted with the Dixon products.

**The Simpson Tire Company**, Detroit, is reported, is considering the establishment of a large plant, either at Los Angeles or Torrance, Cal., for the manufacture of its product.

#### GARAGE AND DEALER.

**The Oakland Motor Company**, Baltimore, Md., has begun the work of remodelling its plant at 8 East Chase street.

**The Bertram Motor Supply Company** has opened a service station in Salt Lake City, Utah. Thomas H. Kane is manager.

**J. H. Daniels**, Eugene, Ore., and son have leased quarters on West 8th avenue and will open a garage. The company will carry accessories and conduct a general repair business.

**The Economy Auto Garage & Supply Company**, West Reading, Penn., has been formed to conduct a garage and automobile business. The company will establish on Penn avenue.

**William Moore**, Oneonta, N. Y., formerly of the Col-



## RECENT PATENTS.

**Cushion Tire**, Charles M. Culp, South Bend, Ind., No. 1,076,024. Filed March 15, 1912.

**Storage Battery Grid**, Jasper N. Davis, Denver, Col., No. 1,076,027. Filed March 17, 1913.

**Motor Vehicle**, John W. Hamm, Higginsville, Mo., No. 1,076,033. Filed July 29, 1910.

**Cushioning Device**, Frederick O. Kilgore, Somerville, Mass., No. 1,076,042. Filed Jan. 10, 1910.

**Worm Drive**, Walter S. Morton, Harrisburg, Penn., No. 1,076,052. Filed Oct. 8, 1912.

**Internal Combustion Engine**, William J. Wright, Franklin, Penn., assignor to Wright Engine Company, Pittsburg, Penn., No. 1,076,090. Filed Sept. 5, 1912.

**Brake Operating Apparatus**, Edwin K. Conover, Paterson, N. J., assignor to Conover Motor Car Company, same place, No. 1,076,226. Filed March 19, 1913.

**Radiator Cell Structure**, Herbert Champion Harrison, Lockport, N. Y., assignor to Harrison Manufacturing Company, same place, No. 1,076,115. Filed Nov. 1, 1912.

**Motor Starter**, John O. Hobbs, Chicago, Ill., No. 1,076,120. Filed Dec. 27, 1911.

**Tire**, Charles Krikava, Burchard, Neb., No. 1,076,127. Filed May 20, 1913.

**Lamp Support**, James D. Stow, Springfield, Mass., No. 1,076,170. Filed Jan. 20, 1913.

**Electric Horn**, George M. Willis, Chicago, Ill., No. 1,076,181. Filed June 20, 1913.

**Vacuum Brake**, James T. Dickson, Los Angeles, Cal., No. 1,076,198. Filed Aug. 7, 1912.

**Radiator**, George E. Farlinger, Detroit, Mich., assignor to Anguish Manufacturing Company, same place, No. 1,076,203. Filed Feb. 23, 1912.

**Dash Lock for Clocks**, Wilson E. Porter, New Haven, Conn., assignor to New Haven Clock Company, same place, No. 1,076,226. Filed March 19, 1913.

**Detachable Rim**, Adolph Schick, Wheeling, W. Va., assignor to Schick Wheel & Tire Company, No. 1,076,238. Filed Aug. 27, 1912.

**Carburetor**, Ralph Shipman, Sunbury, Penn., No. 1,076,244. Filed July 2, 1910.

**Carburetor Regulating Mechanism**, John C. Carpenter, Houston Heights, Tex., No. 1,076,268. Filed Oct. 12, 1912.

**Carburetor**, William Patterson and Frank N. Percival, Chicago, Ill., No. 1,076,309. Filed July 8, 1912.

**Tire Shoe**, Arthur S. Bullock, Aitkin, Minn., No. 1,076,345. Filed April 13, 1912.

**Jack**, Charles A. Hart, Findlay, O., No. 1,076,365. Filed April 5, 1912.

**Dirigible Headlight**, Frank H. Aubeuf, Onelda, N. Y., assignor to one-half to Frank J. Aubeuf, same place, No. 1,076,402. Filed Sept. 3, 1913.

**Demountable Rim**, Wilton Ford Jenkins, Richmond, Va., No. 1,076,430. Filed Oct. 7, 1912.

**Signalling Device**, Harvey P. Noble, Philadelphia, Penn., assignor to one-half to Edwin G. Ott, same place, No. 1,076,443. Filed March 29, 1912.

**Emergency Spindle**, William Harvey Vanskiver, Leetonia, O., assignor to Auto Machine Company, same place, No. 1,076,471. Filed April 7, 1913.

**Open Exhaust Silencer**, Constand Francois Marie Galaine, Rennes, France, No. 1,076,494. Filed Jan. 27, 1913.

**Spark Plug**, Frank C. Walsh, Cleveland, O., assignor to the Sharp Spark Plug Company, same place, No. 1,076,535. Filed Oct. 28, 1911.

**Jack**, James T. Dillon, Greenwich, Conn., No. 1,076,555. Filed April 3, 1912.

**Demountable Wheel**, Thomas I. Duffy, Chicago, Ill., assignor to Ellsworth & Cross, same place, No. 1,076,557. Filed July 1, 1910.

**Illuminated Sign**, Peter Lee Ferguson and Joseph W. Wheelwright, Ogden, Utah, No. 1,076,566. Filed Sept. 13, 1912.

**Motor Starter**, George J. Burkhardt, Burlingame, Cal., No. 1,076,660. Filed Oct. 2, 1911.

**Time Register**, Louis H. Friedman, Norfolk, Va., No. 1,076,668. Filed Dec. 18, 1912.

**Lamp Attachment**, William Q. Pfahler, Toledo, O., No. 1,076,699. Filed March 29, 1913.

**Emergency Tire**, Luther M. Tichenor, Owensville, Ind., No. 1,076,719. Filed March 13, 1913.

**Separable Rim**, William M. Wirth, St. Louis, Mo., No. 1,076,730. Filed Aug. 19, 1912.

**Demountable Rim**, Coy Richard Cantrell, St. Louis, Mo., No. 1,076,744. Filed Nov. 23, 1912.

**Primer**, William J. Presley, Grand Haven, Mich., No. 1,076,783. Filed Jan. 13, 1913.

**Carburetor**, Arthur L. Haynes, Clyde, Kan., No. 1,076,827. Filed Feb. 6, 1912.

**Resilient Wheel**, Edward A. Schlairet, Mount Vernon, O., No. 1,076,914. Filed July 31, 1912.

**Tire**, Edwin J. Shaut and William A. Dunham, Jackson, Mich., No. 1,076,916. Filed Oct. 31, 1912.

**Spark Plug**, Albert Schmidt, Flint, Mich., assignor to Champion Ignition Company, same place, No. 1,077,002. Filed May 1, 1911.

## COMING EVENTS.

## November.

Nov. 7-15—Olympia show, London, England.

Nov. 8-12—Track races, Shreveport, La.

Nov. 8-15—Show, Atlanta, Ga.

Nov. 17-19—Electric vehicle show, Copley Plaza Hotel, Boston, Mass.

Nov. 22-29—Show, Providence, R. I.

## December.

Dec. 1-3—Annual meeting, American Automobile Association, Richmond, Va.

Dec. 9-12—Convention, American Road Builders' Association, Philadelphia, Penn.

Dec. 10-12—Convention, Retail Implement & Vehicle Dealers' Association, Milwaukee, Wis.

Dec. 11-20—International exposition of safety and sanitation, American Museum of Safety, New York City.

## January.

Jan. 2-10—Importers' Salon, Hotel Astor, New York City.

Jan. 3-10—Pleasure car show, Grand Central Palace, New York City.

Jan. 4-8—Winter meeting, Society of Automobile Engineers, New York City.

Jan. 10-16—Show, Milwaukee, Wis.

Jan. 10-17—Show, Cleveland, O.

Jan. 12-17—Show, Bridgeport, Conn.

Jan. 24-31—Show, Rochester, N. Y.

Jan. 24-31—Pleasure car show, Coliseum, Chicago, Ill.

Jan. 26-31—Show, Scranton, Penn.

Jan. 31-Feb. 7—Show, Minneapolis, Minn.

## February.

Feb. 2-7—Pleasure car show, Buffalo, N. Y.

Feb. 9-14—Truck show, Buffalo, N. Y.

Feb. 16-21—Show, Kansas City, Mo.

Feb. 18-21—Show, Bloomington, Ill.

Feb. 21-28—Show, First Regiment Armory, Newark, N. J.

Feb. 22-March 6—Show, Cincinnati, O.

Feb. 23-28—Show, Omaha, Neb.

## March.

March 2-6—Show, Fort Dodge, Ia.

March 7-14—Pleasure car show, Mechanics' Building, Boston, Mass.

March 9-14—Show, Des Moines, Ia.

March 17-21—Truck show, Mechanics' Building, Boston, Mass.

## April.

April 9-15—Show, Manchester, N. H.

## May.

May 30—500-mile race, Indianapolis, Ind.

"PASS THEM ALL"



MOTOR CARS

Send for Pleasure or Commercial Catalogue.  
KNOX AUTOMOBILE CO., SPRINGFIELD, MASS.





PROVIDENCE  
**AVTO-SHOW**  
A STATE ARMORY



**PREST-O-LITE** IS THE MOST  
LIGHTING SYSTEM CONVENIENT

All the Facts on all Lighting Systems mailed you on request.  
**THE PREST-O-LITE CO., Inc., 226 Speedway, Indianapolis, Ind.**  
(1) (Contributor to the Lincoln Highway)

**Wait! Don't Contract**

till you see our announce-  
ment. It will appear soon.

**MOLINE AUTOMOBILE COMPANY**  
East Moline, Ill.

**CAMERON CARS \$975**  
All Up-To-Date Features

Four cylinder, water cooled, 30 H. P. Four forward speeds.  
112 in. wheelbase. Left hand drive, centre control. Starts from  
seat. Pointed hood, beautiful lines and finish. Equipment  
unsurpassed at the price.

Write for full details and terms to agents  
**THE CAMERON MANUFACTURING CO. West Haven, Ct.**

**Tarvia**

**PREVENTS DUST  
PRESERVES ROADS**

*Booklets on request*

**BARRETT MANUFACTURING CO.**

New York, Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburgh,  
Cincinnati, Kansas City, Minneapolis, Corey, Ala.



**DECARBONIZER**

Chemically removes carbon from cylinders,  
pistons, rings and valves

**INCREASES POWER 20 PER CENT.**

Volatilizes carbon, in which form it passes out thru exhaust;  
injury to metal impossible. Agents wanted in  
certain localities. Sample quart can \$1.50. Write  
today for particulars.

**MILWAUKEE AUTO SPECIALTY COMPANY**  
128 Second St., Milwaukee, Wis.

**GYROSCOPE PRINCIPLE**

**The New Jones Speedometer Unaffected by Heat or Cold**

Any motor car maker will equip with it if you state plainly you  
want nothing else, no matter what speedometer he may list in his  
catalog as equipment.

Write us for facts, test and experiments that show Jones suprem-  
acy beyond question.

**THE JONES SPEEDOMETER—Broadway at 76th Street, NEW YORK**

**INSIST ON GETTING**

**Colonial Motor Oil**

No substitute "just as good"

**Borne, Scrymser Company**  
NEW YORK BOSTON FALL RIVER PHILADELPHIA

**J.M. Shock Absorber**



Its efficiency is proved by scientific facts—not mere  
claims. Write for Ovington Data D. to **The J. M.  
Shock Absorber Co., 210 S. 17th Street, Philadelphia.**  
Branches in Boston, Hartford, Providence, and all leading cities

*For Perfect Control and Safe, Comfortable Driving use*

**Weed Anti-Skid Chains**

At all Reputable Dealers  
**Weed Chain Tire Grip Co., New York**

**"The right way to light the way"**  
**Aplco Electric Lighting System**

Penetrates fog, mist and rain as well  
as darkness. It is a simple, economical  
and reliable electric lighting system.

Write for full particulars,  
**THE APPLE ELECTRIC COMPANY**  
74 Canal St., Dayton, Ohio



**Studebaker**

"Accessibility of the motor a leading feature"  
"25"—\$885 "35"—\$1290 "SIX"—\$1550  
All prices for cars fully equipped F. O. B. Detroit.  
**STUDEBAKER, - - - DETROIT, MICH.**

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# The "Black Eagle" Spark Plug

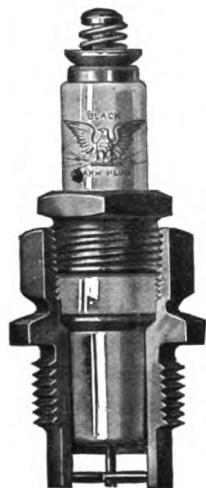
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## 50 Cents Is Enough

The "Black Eagle" Spark Plug has made good because it was designed and manufactured with this result in view.

A person in close touch with the supply and manufacturing ends of the trade was a visitor at our factory recently, and was shown the details of construction, including the machinery, testing, and assembling of the "BLACK EAGLE" Spark Plug. What he said we believe will be of interest to you, as it indicates the effort on our part to supply a high grade plug at a reasonable price. We therefore quote below his impressions.

"I am simply amazed at the workmanship, material, and construction of the 'BLACK EAGLE' Spark Plug. When I saw this plug advertised at a price of 50c to the consumer, I naturally supposed it was a cheap, common, plug such as you occasionally find in jobbing houses on the bargain counter. I am convinced, after seeing these plugs tested, and examining minutely the machine parts which enter into their construction, that no better porcelain spark plug is offered by any one, regardless of the price they ask."



We are not influenced by what our competitors charge for spark plugs! We have ignored price precedent, for the reason that a high grade spark plug can be manufactured and sold at 50c each, and that is enough.

Sent prepaid on receipt of price. Made in all standard threads.

### THE STANDARD CO.

### Torrington, Conn., U. S. A.

#### F. SHIRLEY BOYD

903 Boylston St.

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Derian Demountable Rims.

Supplementary Spiral Springs.

R. I. V. Ball Bearings.

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Graphite Grease is the Ideal Lubricant for Transmissions and Differentials. Write for the Book "Lubricating the Motor," No. 210.

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#### FOR YOUR AUTO OR GARAGE

The Pyrene Extinguisher is handsomely finished and may be carried in our special holder on the dashboard or any other convenient point of your car.

Write for Booklet

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MAGNETIC PRINCIPLE

95% of all the speedometers to be made during 1913 will be built on the magnetic principle.

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Branches in all principal cities all over the world

## THE HEINZE ELECTRIC COMPANY

MANUFACTURERS OF

## Ignition and Generating Apparatus LOWELL, MASS.

Factory and Main Office:  
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\$3250 Completely Equipped

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THE 10% OVERWEIGHT TIRES  
Guaranteed for 4000 Miles Service

Measured by Mileage, the Cheapest Shoes Ever Made. Clincher and Quick Detachable, Plain and Break-Skid Treads, Regular and Metric Sizes, for All Standard Rims.

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**AUTOMOBILE OIL**  
No. 300  
MANUFACTURED BY  
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If you really appreciate the value of a strictly mineral oil that's free from all animal, vegetable or carbon matter—an oil that will really preserve your car, you'll use only

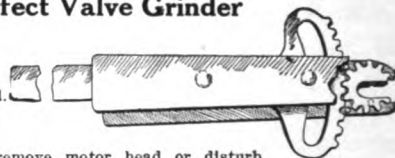
**EMCO OIL**

**GUARANTEE**  
If Emco Oil does not prove satisfactory to YOU in absolutely every respect, we will refund your money in FULL—pay freight (both ways if oil is returned) and make no charge for oil used in trial.  
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No need to remove motor head or disturb valve mechanism. A simple, practical tool, that works automatically and any one can operate it. Guaranteed, and will last for years. A new, simple and practical guide for owner, driver and repairer. Keep your valves in perfect condition. Cost of grinder saved first time used. For circulars and price list write

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"Always There"

The SPLITDORF "T S" TRANSFORMER is interchangeable with any type tube or dash coil and can be attached to any car. We will make a very liberal allowance on an old coil in exchange for one of the new style.

Write TODAY for particulars.

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12 Issues. \$2.00 the Year.

**Let Your Motor Do The Work**

The Pump that took the "Shun" out of Inflation.

It's a **pleasure** to inflate your tires without sweating, fuming and straining.

It's an **economy** to get the exact pressure you need to make your tires give maximum service.

It's a **convenience** to attach and detach your pump without a wrench. A twist of the wrist and a few seconds of time to attach the pump, one to four minutes with your

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**THE BROWN IMPULSE TIRE PUMP** for 1913 is the **only** tire pump that attaches and detaches without a wrench; the **only** one that includes hose, self-opening valve connection, high grade recording gauge and Quick Detachable Spark Plug as part of its regular equipment. Your 1913 equipment is not complete without it. It sells for \$15.00. Ask your dealer today. If he can't tell you all about it, send to us for descriptive literature.

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**COLE** THE STANDARDIZED CAR

The car that started the stampede to standardization  
A Cole franchise is a valuable asset to any dealer. Find out about it.

**Cole Motor Car Co. of Indianapolis**

ALWAYS SPECIFY  
**HOYT METERS**

AND GET YOUR MONEY'S WORTH  
**HOYT ELECTRICAL WORKS**  
INSTRUMENT  
PENAGOOK, NEW HAMPSHIRE

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A Handy Reference for Purchasers

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**Auto Parts Co.,** Providence, R. I.  
**Hopewell Brothers,** Newton, Mass.  
 Branch: 1974 Broadway at 67th St., New York.  
**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City.  
**Miller, Chas. E.,** 97-103 Reade St., New York.  
 Branches: 303-304 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave., and 2782 Broadway, New York; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 259 Peachtree St., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 125 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.  
**Milwaukee Auto Specialty Co.,** 128 Second St., Milwaukee, Wis.  
**Motor Parts Co.,** 185-187 Columbus Ave., Boston; 818 No. Broad St., Philadelphia; Springfield, Mass.  
**Northwestern Chemical Co.,** Marietta, O.  
**Waite Auto Supply Co.,** 81 Exchange place, Providence.

ACETYLENE TANKS. (See Tanks.)

ADJUSTERS.

**Vanstekle, John A.,** Indianapolis. (Ford Ideal Ball and Socket Joint.)

AIR COMPRESSORS AND TANKS.

**Williams Foundry & Machine Co.,** Akron, O.

AMMETERS AND VOLTMETERS.

**Hoyt Electrical Instrument Works,** Penacook, N. H.

AUTOMOBILES. (See Cars.)

AUTOMOBILE SPECIALTIES.

**Cox Brass Mfg. Co.,** Dudley Ave., Albany, N. Y. (Brass Goods.)

**Motor Specialties Co.,** 2 Cooper Lane, Waltham, Mass.

BALLS AND BALL BEARINGS.

**Boyd, F. Shirley,** 903 Boylston St., Boston. (R. I. V.)

**Brets Co.,** J. S., 250 W. 54th St., New York. (F. & S.)

**Hyatt Roller Bearing Co.,** Detroit.

**Marburg Bros., Inc.,** 1790 Broadway, New York. (S. R. O.)

**New Departure Mfg. Co.,** Bristol, Conn.

**Rhineland Machine Works Co.,** 140 W. 42nd St., New York City.

Branches: 1254 Michigan Ave., Chicago; 650 Woodward Ave., Detroit; 1424 Vine St., Philadelphia; 220 Motor Mart, Boston.

**S. I. V. Co.,** 1771 Broadway, New York. (R. I. V.)

BATTERIES.

**Burn-Boston Battery Co.,** 19 Doane St., Boston.

**Electric Storage Battery Co.,** Philadelphia. (Exida.)

**Gelsner Bros. Storage Battery Co.,** 514 W. 57th St., New York.

**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City. (J-M.)

**Waite Auto Supply Co.,** 81 Exchange place, Providence. (Success.)

**Willard Storage Battery Co.,** 5716 Euclid Ave., Cleveland. (LBA Lighting and Starting.)

Branches: 136 West 52nd St., New York; 1191 Woodward Ave., Detroit; 2241 Michigan Ave., Chicago; 243 Monadnock Bldg., San Francisco.

BATTERY EXTINGUISHERS.

**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City.

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Everybody now insists on full car value for their money—and a *past* instead of a *future* record.

### Take your time in making a selection

No car built has anything on the Stutz for style and beauty, roominess, easy operation, freedom from trouble, low cost mileage, power and convenience.

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**Stutz Motor Car Company**  
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STUTZ — the car that made good in a day

Six Cylinder  
65 H. P.  
Equipped  
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Electric Gear  
Shift

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America's First Car

Four Cylinder  
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Shift

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**BRETZ COMPANY**  
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**Magneto**  
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 1790 Broadway, New York  
 Detroit Chicago

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**BODIES, TRUCK.**

**Motor Truck Body Co., 320 Franklin St., Detroit**

**BODIES—WOOD AND METAL.**

**Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.**

**BRAKE BANDING OR LINING.**

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**Standard Woven Fabric Co., Framingham, Mass. (Multibestos.)**

**Branches:** F. Shirley Boyd, 903 Boylston St., Boston; C. D. Schmidt, 276 Canal St., New York City; N. A. Petry Co., 1427 Vine St., Philadelphia; F. E. Sparks, 1430 Michigan Blvd., Chicago; Fred Ward & Son, San Francisco.

**BRUSHES, WIRE.**

**Williams Foundry & Machine Co., Akron, O.**

**BUMPERS AND FENDERS.**

**Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.**

**Sager Co., J. H., 271 South Ave., Rochester, N. Y.**

**CABLES.** (See Wires.)

**CARBON REMOVERS.** (See Cylinder Cleaning Compound.)

**CARBURETORS.**

**Planhard Mfg. Co., 1790 Broadway, New York. (Planhard.)**

**CARS—ELECTRIC PLEASURE.**

**Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)**

**Baker Motor Vehicle Co., Cleveland. (Baker.)**

**CARS—GASOLINE PLEASURE.**

**Austin Automobile Co., Grand Rapids, Mich. (Austin.)**

**Cameron Mfg. Co., West Haven, Conn. (Cameron.)**

**Cartercar Co., Pontiac, Mich. (Cartercar.)**

**Cole Motor Car Co., Indianapolis, Ind. (Cole.)**

**Empire Automobile Co., Indianapolis, Ind. (Empire.)**

**Little Aristocrat.)**

**Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)**

**Henderson Motor Car Co., Indianapolis. (Henderson.)**

**Herreshoff Motor Co., 620 Harper Ave., Detroit. (Herreshoff.)**

**Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)**

**Keeton Motor Co., Detroit. (Keeton.)**

**Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)**

**Knox Automobile Co., Springfield, Mass. (Knox.)**

**Maxwell Motor Co., Inc., Detroit. (Maxwell.)**

**Mercer Automobile Co., 1100 Whitehead Road, Trenton, N. J. (Mercer.)**

**Moline Automobile Co., E. Moline, Ill. (Moline.)**

**National Motor Vehicle Co., 1033 22d St., Indianapolis. (National.)**

**Nordyke & Marmon Co., Indianapolis. (Marmon.)**

**Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)**

**Paige-Detroit Motor Car Co., Detroit. (Paige.)**

**Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)**

**Reo Motor Car Co., Lansing, Mich. (Reo.)**

**Studebaker Corp., Detroit. (Studebaker.)**

**Stutz Motor Car Co., Indianapolis. (Stutz.)**

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**White Co., The, 828 E. 79th St., Cleveland. (White.)**  
 Branches: 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.  
**Willys-Overland Co., Toledo, O. (Overland.)**

**CARS—STEAM PLEASURE.**

**White Co., The, 828 E. 79th St., Cleveland. (White.)**  
 Branches: See Cars—Gasoline Pleasure.

**CARS—GASOLINE COMMERCIAL.**

**Adams Bros. Co., Findlay, O. (Adams.)**  
**Bessemer Motor Truck Co., Grove City, Penn. (Bessemer.)**  
**Blair Mfg. Co., Newark, O. (Blair.)**  
**Brown Commercial Car Co., Peru, Ind. (Brown.)**  
**Cartercar Co., Pontiac, Mich. (Cartercar.)**  
**Dart Manufacturing Co., Waterloo, Ia. (Dart.)**  
**Driggs-Seabury Ordnance Corp., Sharon, Penn. (Vulcan.)**  
**Federal Motor Truck Co., Junction and Leavitt Sts., Detroit. (Federal.)**  
**Garford Co., Elyria, O. (Garford.)**  
**General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)**  
 Branches: New York, Chicago, Boston, Philadelphia, Kansas City.  
**Gramm-Bernstein Co., Lima, O. (B. A. Gramm's.)**  
**Knox Automobile Co., Springfield, Mass. (Knox and Martin Tractor.)**  
**Owen & Co., R. M., 19 W. 62d St., New York City. (Reo.)**  
**Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)**  
**Reo Motor Car Co., Lansing, Mich. (Reo.)**  
**Studebaker Corp., Detroit. (Studebaker.)**  
**Sullivan Motor Car Co., 1707 East Ave., Rochester, N. Y. (Sullivan.)**  
**Williet Engine & Truck Co., Inc., 8-10 Lock St., Buffalo. (Williet.)**  
**Willys-Overland Co., Toledo, O. (Overland.)**

**CARS—ELECTRIC COMMERCIAL.**

**Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)**  
**Atlantic Vehicle Co., Factory, Newark, N. J.; 1600 Broadway, New York City; 10 Postoffice Sq., Boston. (Atlantic.)**  
**Baker Motor Vehicle Co., Cleveland. (Baker.)**  
**Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)**  
 Branches: 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.  
**General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)**  
 Branches: See Cars—Gasoline Commercial.  
**General Vehicle Co., Long Island City, N. Y. (G. V.)**

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**Cartercar Co., Pontiac, Mich. (Cartercar.)**  
**Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)**  
 Branches: See Cars—Electric Commercial.  
**Knox Automobile Co., Springfield, Mass. (Knox and Martin Tractor.)**  
**White Co., The, 828 E. 79th St., Cleveland. (White.)**  
 Branches: See Cars—Gasoline Pleasure.  
**Willys-Overland Co., Toledo, O. (Overland.)**

**CATALOGUE SYSTEMS.**

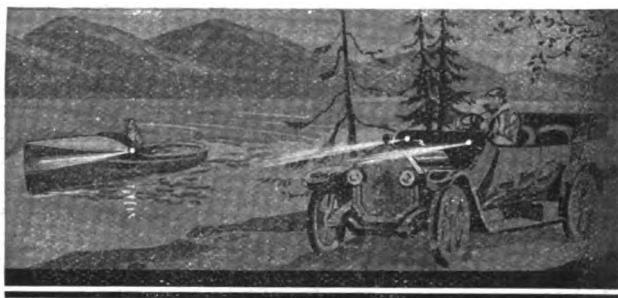
**Catalogue Systems Co., Fisher Bldg., Chicago, Ill.**

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These lamps can be operated for one-third as much as standard equipment. They give a light of remarkable brilliance. Used for dash lights, tail lights and for illuminating speedometer and interior of car. Also for motor boats, camps, etc.  
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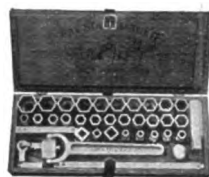
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Guaranteed perfect satisfaction or money refunded

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Easy to put up. Portable. All sizes. Postal brings latest illustrated catalog.

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The Shock Absorbers Which Save Your Car and Tires.  
Nothing to Wear, Adjust or Require Attention.  
They Take The "Sting" Out of Rough Roads.  
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Seven Years Of Success.

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THOUSANDS OF DOLLARS

Saved Annually by Use of Sager Bumpers.  
Don't Wait for a "Smash-up" to Buy Protection.

DO IT NOW.

PRICES \$6.00 to \$27.50.

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Clamped on Bumpers of Distinction. 30 Models. Attached in 10 Minutes  
FORD SPECIAL, CLAMPED ON, \$10.

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271 South Avenue, Rochester, N. Y.

## Cartercar

With the gearless transmission—will give better service than is possible for a gear car. Unlimited speeds—climbs steep hills—gives double the usual tire mileage.

CARTERCAR COMPANY, Pontiac, Mich.

Send for catalog

**PAIGE**

"36"—\$1275  
"25"—\$ 950

Leaders of popular-priced cars—thoroughly built, completely equipped, backed by a strong organization. Specifications and catalog on request.

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#### CHAINS, TIRE, AND ANTI-SKIDDING DEVICES.

Weed Chain Tire Grip Co., 28 Moore St., New York.

#### CHAINS—TRANSMISSION OR DRIVING.

Beyd, F. Shirley, 903 Boylston St., Boston. (Baldwin.)  
Miller, Chas. E., 97-103 Reade St., New York. (Bramp-ton.)  
Branches: See Accessory Manufacturers and Jobbers.)

#### CLUTCHES—AUTOMOBILE FRICTION.

Brets Co., J. S., 250 W. 54th St., New York. (Hartford Cone.)

#### COILS.

Heinze Electric Co., Lowell, Mass.  
New York Coil Co., 338 Pearl St., New York City.

#### CYLINDER CLEANING COMPOUND.

Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.  
Milwaukee Auto Specialty Co., 128 Second St., Milwaukee.  
Northwestern Chemical Co., Marietta, O. (Carbonox.)  
Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Carbon Remover.)  
Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

#### FIRE EXTINGUISHERS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.  
Northwestern Chemical Co., Marietta, O. (Fire-Fly.)  
Pyrene Co. of New England, 176 Federal St., Boston.

#### FUNNELS, AUTO.

Dover Stamping & Manufacturing Co., Cambridge, Mass. (Dover.)

#### GASKETS AND GASKET CUTTERS.

Brown Co., Inc., Chas. D., 49 Federal St., Boston. (Val-lumold.)  
Shawver Co., Springfield, O.

#### GAUGES.

National Motor Supply Co., 1911 Euclid Ave., Cleveland. (Tire Pressure and Gasoline Tank.)  
Branches: In all principal cities.

#### GEARS, STEERING.

Ross Gear & Tool Co., 794 Heath St., Lafayette, Ind.

#### GUNS, GREASE. (See Oil Pumps.)

#### HORNS.

Dean Electric Co., Elyria, O. (Tuto.)  
Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.  
Kent Mfg. Works, Atwater, 4937 Stenton ave., Wayne Junction, Philadelphia. (Monoplex.)  
Motor Specialties Co., 2 Cooper Lane, Waltham, Mass. (Fogg.)

#### HOUSES, PORTABLE STEEL.

Kolb Sales Co., 1790 Broadway, New York. (Ruby.)  
(Continued on Next Page.)



(BUYERS' GUIDE—Continued.)

IGNITION EQUIPMENT.

Kent Mfg. Works, Atwater, 4937 Stenton ave., Wayne Junction, Philadelphia.

INSULATION.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

JACKS, ETC.

Shawver Co., Springfield, O.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)  
Branch: 1974 Broadway, New York.

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National Motor Supply Co., 1911 Euclid Ave., Cleveland, O.  
Branches: In all principal cities.

LIGHTING SYSTEMS, ELECTRIC.

Apple Electric Co., Dayton, O. (Apico.)

Dean Electric Co., Elyria, O. (DynaLux.)

Johns-Manville Co., H. W., Madison Ave., and 41st St., New York City.

Remy Electric Co., Anderson, Ind. (Remy.)

LOCKS, AUTOMOBILE.

Bracelet Auto Lock Co., 32 No. Clark St., Chicago.

LUBRICANTS.

Berne, Scrymser Co., 80 South St., New York. (Colonial.)  
Branches: Boston, Fall River, Philadelphia.

Dixon Crucible Co., Jos., Jersey City, N. J. (Graphite.)

Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagle-line No-Karbon.)

Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)  
Branch: 143 No. Wabash Ave., Chicago.

Mays, Geo. A., 143-144 Front St., New York. (Panhard.)  
Branch: 399 Boylston St., Boston.

Indian Refining Co., 17 Battery Place, New York. (Distributors of Havoline Oil.)

Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Building, Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.

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Branches: 284 Columbus Ave., Boston; 113 Arch St., Philadelphia; 512 Kenois Bldg., 11th and G Sts., N. W., Washington, D. C.

Miller, Chas. E., 97-103 Reade St., New York. (Pan-American.)  
Branches: See Accessory Manufacturers.

New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)

Northwestern Chemical Co., Marietta, O. (Gear-Silence.)

Standard Oil Co., New York. (Polarine.)  
Branches: In all cities.

Texas Company, The, 7 West St., New York.

Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo, Tulsa, Houston.

Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)  
Branches: 49 Federal St., Boston; 29 Broadway, New York; Fourth and Chestnut Sts., Philadelphia; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.; Fisher Bldg., Chicago; Ford Bldg., Detroit; Indiana Pythian Bldg., Indianapolis.

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Testor "T" head motors, full floating rear axles, Brown-Lipe differential, Warner transmission, Eisemann Magneto, Carter Carburetor, handsome jewel bodies with ventilating windshield. Completely equipped, with every convenience and comfort. Dynamo electric lighting and electric starter (Gray & Davis system), power tire pump. We have the greatest agency proposition in the United States. Write for our beautiful art book showing cars in detail.

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Airless Tires

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Bosch Magneto Co., 223-225 W. 46th St., New York.  
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Brets Co., J. S., 250 W. 54th St., New York. (U. &amp; H.)

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Marburg Bros., 1790 Broadway, New York. (Mea.)

Remy Electric Co., Anderson, Ind. (Remy.)

Splitdorf Electrical Co., 98 Warren St., Newark, N. J.

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New York Coil Co., 338 Pearl St., New York City.

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Dover Stamping &amp; Manufacturing Co., Cambridge, Mass. (Auto and Savol.)

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Northwestern Chemical Co., Marietta, O. (Hydrometers and Thermometers.)

## MOTORCYCLES AND SUPPLIES.

Miami Cycle & Manufacturing Co., 320 Hanover St., Middletown, O. (Flying Merkel.)

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Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.

Remy Electric Co., Anderson, Ind. (Remy.)

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Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

## PAINT, ANTI-RUST.

Northwestern Chemical Co., Marietta, O. (Never-Rust.)

## PATCHES.

National Motor Supply Co., 1911 Euclid Ave., Cleveland.

## POLISH.

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Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

Northwestern Chemical Co., Marietta, O.

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Boyd, F. Shirley, 903 Boylston St., Boston. (Dorian.)  
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Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (Asbestos.)

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Rhineland Machine Works Co., 140 W. 42nd St., New York City. (Lindhe Laminated.)  
Branches: See Balls and Ball Bearings.


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Boyd, F. Shirley, 903 Boylston St., Boston.  
Hudson Export and Import Co., 140 W. 42nd St., New York City. (A. V.)  
J. M. Shock Absorber Co., 210 So. 17th St., Philadelphia. (J. M.)  
Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Peerless.)

SOAPS.

Hopewell Bros., Newton, Mass. (Paos.)  
Branch: 1974 Broadway, New York.  
Northwestern Chemical Co., Marietta, O. (Dermalene.)  
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**Herreshoff** Electric Self-Cranking  
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Four Forward Speeds

"Six-Forty" Touring Car and Roadster \$1850—7-Pass. \$1900  
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The  
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 Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.  
 Mosler, A. R., & Co., P. O. Box M, Mt. Vernon, N. Y. (Spit Fire.)  
 Rhineland Machine Works Co., 140 W. 42nd St., New York City.  
 Branches: See Balls and Ball Bearings.  
 Splitdorf Electrical Co., 98 Warren St., Newark, N. J.  
 Branches: See Magnetos and Magneto Supplies.  
 Standard Co., The, Torrington, Conn. (Black Eagle.)

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 Jones Speedometer, New Rochelle, N. Y.  
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 Northwestern Chemical Co., Marietta, O. (Hydrometers and Thermometers.)  
 Service Recorder Co., 2245 East 105th St., Cleveland. (Servis.)  
 Stewart-Warner Speedometer Corp., Chicago. (Auto-Meter.)  
 Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330 1/2 North Illinois St., Indianapolis; 1613 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia; 5940 Kirkwood Ave., Pittsburgh; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

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 Perfection Spring Co., No. 1 Plant, 2414 Superior Ave., N. W.; No. 2 Plant, East 65th and Central Ave., Cleveland.

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Ward's Sons, E. T., 25 Purchase St., Boston, Mass. (Seamless.)

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Seafie & Sons Co., Wm. B., Pittsburg, Penn.  
 Branch: New York City.

**TANKS, ACETYLENE GAS.**

Prest-O-Lite Company, 271 East South St., Indianapolis. (Prest-O-Lite.)  
 Branches: See Cylinder Cleaning Compound.  
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**(BUYERS' GUIDE—Continued.)****TANKS FOR FUEL AND WATER.**

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(Baby Tire Filler, The Emancipator.)  
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Branches: See Rims—Removable and Detachable.  
**Shawver Co.,** Springfield, O. (Tools.)

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**Cataract Rubber Co.,** Wooster, O. (Cataract.)  
Branches: Boston, New York, Providence.  
**Dayton Rubber Mfg. Co.,** Dayton, O. (Dayton Airless.)  
**Firestone Tire & Rubber Co.,** Akron, O. (Firestone.)  
Branches: See Rims—Removable and Detachable.  
**Gaulois Tire Co.,** 1926 Broadway, New York. (Gaulois.)  
**Goodyear Tire & Rubber Co.,** Madison St., Akron, O.  
(No-Rim-Cut.)

Branches: In all principal cities.

**United States Tire Co.,** Broadway and 58th St., New York.  
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Branches: See Rims—Removable and Detachable.

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**Cataract Rubber Co.,** Wooster, O. (Cataract.)  
Branches: Boston, New York, Providence.

**Firestone Tire & Rubber Co.,** Akron, O. (Firestone.)  
Branches: See Rims—Removable and Detachable.

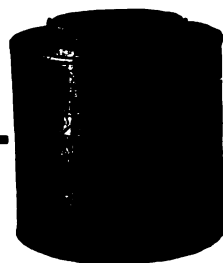
**Mots Tire & Rubber Co.,** The, Akron, O. (Electric Special Motz Cushion.)  
Branches: Boston, New York, Philadelphia, Pittsburg, Chicago, Kansas City, Detroit, Cleveland, Los Angeles.

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Branches: See Rims—Removable and Detachable.  
**Goodrich Co.,** H. F., Akron, O. (Goodrich.)  
**Mots Tire & Rubber Co.,** The, Akron, O. (Mots.)  
Branches: See Tires—Cushion.  
**Polack Tyre and Rubber Co.,** 246 W. 59th St., New York City. (Polack.)  
**United States Tire Co.,** Broadway and 58th St., New York.

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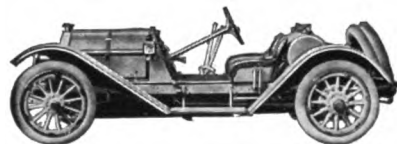
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Do not mix oil and grease in your transmission when you can get this lubricant of ideal consistency. It quiets and protects gears and perfectly lubricates the ball or roller bearings in the transmission. One filling suffices for thousands of miles.

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Type 35  
Series J  
Raceabout  
Guaranteed  
Speed—Mile in  
51 Seconds

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The car which most perfectly meets the medium weight demand. Dealers should carefully consider this fact.

Write today regarding unallotted Territory.

**MERCER AUTOMOBILE CO.,** 1100 Whitehead Road  
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Are of the highest quality and the cheapest on mileage. They are built to last. Send for price list and particulars.

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Heavy, Medium and Light

**Automobile Oils**

27 STATE STREET, BOSTON, MASS.



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**Accessory and Garage Journal**  
**TIMES BUILDING, PAWTUCKET, R. I.**

**(BUYERS' GUIDE—Concluded.)**

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**TROUBLE FINDERS.**

Hopewell Brothers, Newton, Mass. (Vibrator.)  
Branch: 1974 Broadway, New York.

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Winsor Manufacturing Co., Providence, R. I.

**VENTILATORS.**

Wattles, C. B., 441 Butler Exchange, Providence, R. I. (Excelsior Adjustable.)

**VOLTMETERS—(See Ammeters.)**

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Branches: In all principal cities.

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Autogenous Welding Equipment Co., Springfield, Mass.

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Branches: See Cylinder Cleaning Compound.

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**WRENCHES AND COMBINATION OUTFITS.**

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Coes Wrench Co., Worcester, Mass.

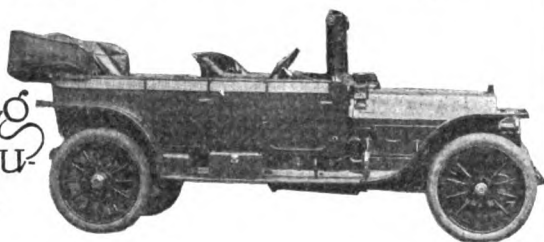
Cutter, George A., Taunton, Mass.

Walworth Manufacturing Co., Boston. (Stillson.)

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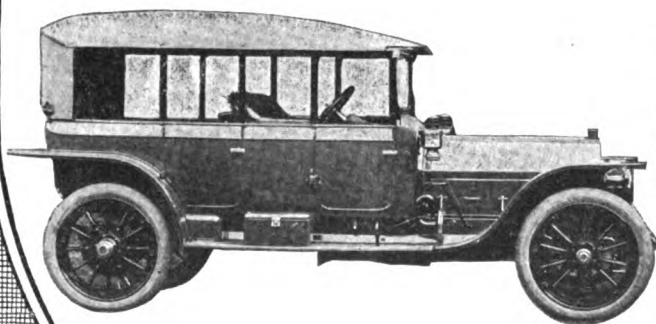


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Changes can be made on the road as readily as in the garage. No matter what the occasion or requirement, your car with the

SPRINGFIELD CONVERTIBLE BODY is always ready and always has



the accommodation and protection you desire.

Can be raised or lowered

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SPRINGFIELD METAL BODY CO.

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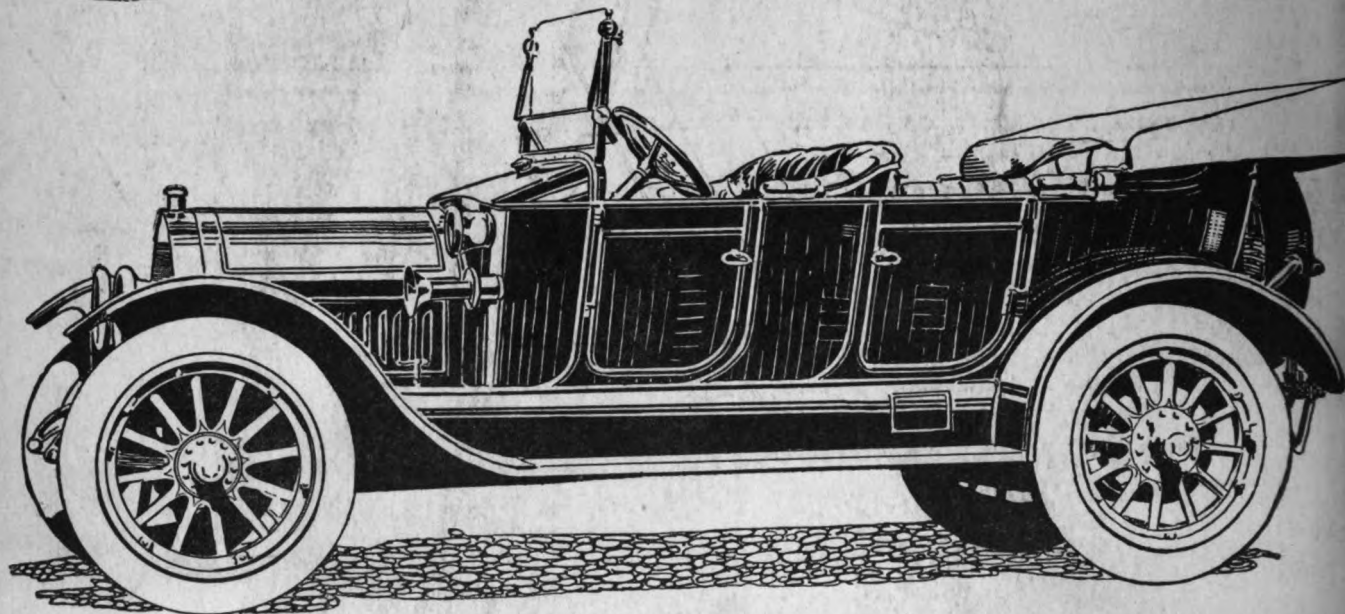
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"The Car of Silence"



## Just Three Reasons—

Here are three out of hundreds of reasons that are influencing dealers in securing the Lyons-Knight agency—

(1) The makers have one of the world's greatest automobile plants—are backed by unlimited capital and are leaving nothing undone to make this proposition a success.

(2) The car itself, with finest Knight motor, worm drive and many other distinctive features, offers the greatest of values at any price. The line also includes a smaller four-cylinder Knight car, a six-cylinder Knight car and commercial cars, meeting every class of trade.

(3) The dealer's proposition is by far the most liberal offered by any reliable manufacturer. It includes

substantial profits for every Lyons-Knight dealer.

Already many of the most important cities are taken by prominent and well-established dealers. They are without exception men of years of experience, who have quickly realized the opportunities of this great proposition.

Your territory will be closed just as soon as we find the right dealer. There are going to be good profits for the Lyons-Knight dealer right in your town. If you will write us for particulars we will gladly show you hundreds of other reasons why this is true.

*Ask for our Advance Catalog and  
"Proofs of the Lyons-Knight" today*

**Lyons-Atlas Company**  
INDIANAPOLIS INDIANA

## Lyons-Knight Features

*50 horsepower silent Knight engine—the finest power plant ever made.*

*Silent, smooth, efficient worm drive.*

*130-inch wheel base with 37x5-inch tires, non-skid in rear, on quick detachable, demountable rims.*

*Full floating rear axle, strong, flexible springs, ample brakes.*

*Left-hand drive, center control.*

*Extra complete equipment, with electric starting and lighting system, patent one-man top with drop side curtains and every other refinement.*

*Price—Five Passenger Touring Car—\$2900; Seven Passenger Touring Car—\$2980. Value—unequalled.*



VOL. XXXVI.

NO. 8.

# AUTOMOBILE JOURNAL

\$1.00 the year  
10 cents the Copy

PAWTUCKET R.I.

November 25, 1913

## HAVOLINE OIL

For Perfect

Lubrication of

Automobile



And Marine

Gasoline Engines

This OIL is NOT AN EXPERIMENT, here today and gone tomorrow, but has for many years maintained the highest reputation as a scientifically prepared lubricant which is properly filtered, so that it burns clean, without leaving carbon deposits on plugs or cylinders.

The biggest engine manufacturers in the East and in the West recommend it; thousands use it on Touring and Racing Automobiles, and Working, Cruising and Racing Motor Boats, and all are pleased to find that

*"It Makes a Difference"*

**INDIAN REFINING COMPANY, Inc.**

17 Battery Place

NEW YORK CITY



**The Largest Automobile Supply House in America**

# The Miller Automobile Jack

The MILLER AUTOMOBILE JACK is a single acting, automatic-lowering jack, designed especially for automobile use and is adapted to the factory or garage as well as to be carried as a part of the equipment on motor cars. The MILLER JACK is constructed of the best material, no complicated or loose fitting parts to get out of order, and in material, workmanship and finish, the MILLER JACK is not exceeded, if indeed, it is equalled by any other jack. It is a high grade and one of the finest finished jacks on the market.

The short stroke makes lifting easy and rapid. Automatically locks while operating, thereby doing away with any possibility of slipping or dropping the load.

Fitted with a simple and convenient trip lever for reversing. Height, 11 inches. Raises 6 inches. Weight, 9 lbs. Capacity, 1 ton.

We guarantee this jack for 12 months, and at the price, it is the best value ever offered to the automobile trade.

We are in a position to quote a special price to manufacturers, jobbers and dealers who buy in quantities.

**CAPACITY: ONE TON.**

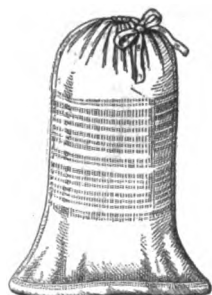
The List Price of the MILLER JACK, guaranteed for twelve months.....\$3.00 each

Weight, packed for Parcel Post, 10 lbs.

**AGENTS WANTED. ADDRESS JACK DEPARTMENT.**



THE MILLER JACK  
Designed for any  
size and style of au-  
tomobile and is  
adapted for all pur-  
poses.



TUBE BAG

**25c A REAL INNER TUBE BAG FOR 25c**

MAILED TO ANYONE IN ANY PART OF THE UNITED STATES  
MADE OF HEAVY NAPPED CLOTH

Will keep your inner tube free from grit and dirt, and from scratching or chafing while in the tool box or luggage carrier. Answers the same purpose as tube bags which cost \$1.50 or more. Will hold one tube 5 inches or smaller. Protect your tubes and reduce your tire expense. In ordering, state size of tube.

Send 25c, in stamps or coin, and tube bag will be sent to you by return mail

Send your name and address NOW with 4 cents postage (to cover cost of mailing) for a free copy of our Big 256 Page Catalog

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Manufacturer, Jobber, Exporter, and Importer  
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Established 1896

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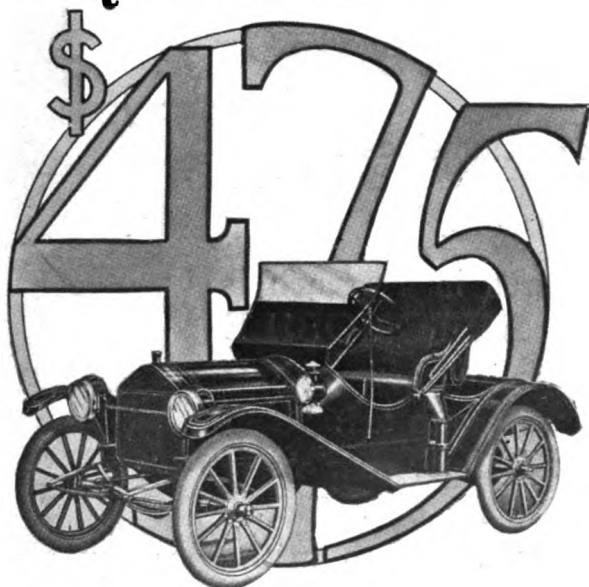
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# METZ

WITH  
STANDARD  
EQUIPMENT



# "22"

WITH  
COMPLETE  
ELECTRIC  
EQUIPMENT

\$125.

EXTRA

## THE GEARLESS CAR

NO CLUTCH TO SLIP—NO GEARS TO STRIP

\$475.00 with standard equipment.—Four-cylinder 221-2 h. p. water-cooled motor, Bosch magneto, wind shield, extension top and storm curtains, full elliptic springs, gas head lights and gas generator, oil dash lights and tail light, bulb horn, artillery wheels, best quality Goodrich clincher tires, pump, tool outfit, etc.

Electric equipment.—Including best electric Starter, electric head lights, electric side lights, electric dash and tail lights, and electric horn, \$125.00 extra.

The METZ "22" is a fully guaranteed Car, left-hand drive, center control, rear finished either in torpedo style or with platform for rumble seat, as desired. It makes 5 to 50 miles per hour on the high speed, is a wonderful hill climber, and travels 28 to 32 miles on one gallon of gasoline, 100 miles on one pint of lubricating oil, and 10,000 to 12,000 miles on a single set of tires. Its GEARLESS TRANSMISSION entirely does away with gear troubles.

New Illustrated Catalog "Q" mailed on request.

We Want a Representative in Every Town. Write for Terms.

# METZ CO., WALTHAM MASS. U.S.A.



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# COES

## THE Wrench Supreme

Strength without bulk or clumsiness.

Ease of handling without slipping or bruising.

Perfect balance and right grip

Everything the motorist desires in a wrench is to be found in the "COES" AUTOMOBILE MODEL, and you will never know perfect wrench service until you pin your faith to it.

It stands to reason that the 5 per cent. more you pay for a "COES" wrench goes for 60 per cent. more quality and service—put this wrench in the tool kit and shop. You will get your money's worth.

Send for Literature Now.

### Coes Wrench Co.

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J. C. McCARTY & CO.,  
21 Murray St., New York City

JOHN H. GRAHAM & CO.,  
113 Chambers St., New York City

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# Use Spark Plugs That Give Real Service

**B**OSCH PLUGS, in addition to being carefully constructed, in addition to being made from the finest of materials obtainable, have 6 special features which make them the better kind of spark plug—Just the plug you want.



**\$1.00 EACH**

is the selling price.  
Shipped from nearby distributors thus reducing shipping costs.

- 1** Crescent Electrodes minimize electrical resistance, affording the maximum spark, therefore maximum power at all speeds. An easy starting motor is always assured.
- 2** Undue wear of electrodes prevented, consequently long life at a vital point is certain.
- 3** Insulator is Steatite, a stone unaffected by intense heat, carbon or oil, and unbreakable by vibration or accident.
- 4** Massive and an exclusive gastight construction—assures full power at any pressure or any speed. Compression leaks are impossible.
- 5** BOSCH PLUGS are “excessively” durable; they last as long and serve as well as you expect a “Bosch Quality Product” will.
- 6** BOSCH PLUGS are as good as Bosch Magneto, you can have every confidence in them.

*Write for “Locating the Spark Plug”  
It's educational and will be sent you free.*

**BOSCH MAGNETO CO., 204 West 46th St., New York**  
**CHICAGO                      DETROIT                      SAN FRANCISCO                      TORONTO**

Bosch Distributors for New England are located at: Portland, Me., Springfield, Mass., and at Boston.

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**\$2400***Nothing extra to pay***\$2400***Completely equipped*

**More Power  
More Flexibility**

**More Economy  
More Silence**

## It's here—a Moline-Knight—\$2400

*For the man who THINKS before he SPENDS*

Now comes the Moline-Knight—the car that makes possible a Knight motored car at a price every motorist can afford—\$2400, fully equipped. The Moline-Knight means instantaneous getaway—less consumption of fuel—more power—no carbon troubles—no valves to clog or grind—fewer parts, simpler parts, less to get out of order.

### The old poppet valve has now outlived its usefulness

The poppet valve served its purpose well in its day—but it has its limitations as any competent engineer will tell you. The manufacturers of motors have spent fortunes and years of labor in an effort to get rid of the poppet valve. The Knight motor solves the problem. Europe took the lead in getting rid of the poppet valve—and the result is such celebrated cars as the Mercedes, Daimler, Panhard and Minerva using the Knight motor.

### Moline-Knight backed by 23 years of successful manufacturing

Charles Y. Knight—the inventor and designer of the Knight sleeve valve type of motor granted a license to the Moline Automobile Company because along with their nine years successful experience as motor car producers they had an additional fourteen years as builders of gasoline engines.

No other organization in the entire motor car industry is better equipped with brains, experience, skilled workmen, modern machinery, systematized plant or financial responsibility to build the **supreme** Knight than the Moline Automobile Company.

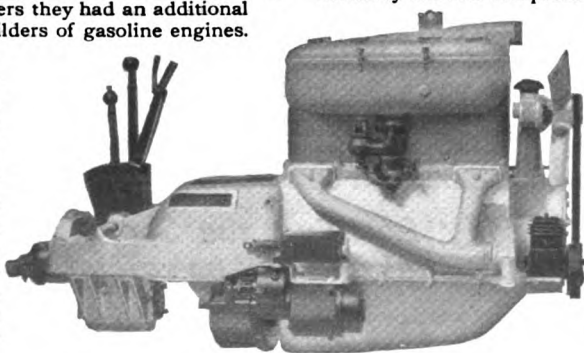
### Poppet valve disadvantages

To get power and speed in the poppet valve engine, high compression, large valves, strong springs and precipitous cams are necessary. These large valves and their seats will often warp. They do not cool properly and the strong springs necessary to seat them at high speed soon weaken, or actually pound the head of the valve out of shape.

### Why the Moline-Knight is supreme over the poppet valve motor

The superiority of the Moline-Knight motor over any poppet valve lies in the fact that the sleeve valve system is not affected by high pressures. The explosion does not affect nor shock it at any point because the sleeve valve is balanced against lateral pressures. The sleeve valve motor combines the silence, economy and low compression of the small poppet

valve motor with the high compression, large valves, powerful springs and long cams of the racing poppet valve motor—consequently, the Moline-Knight motor—with none of the poppet valve disadvantages—has all the advantages of both types of poppet valve motors plus all the sleeve valve advantages.

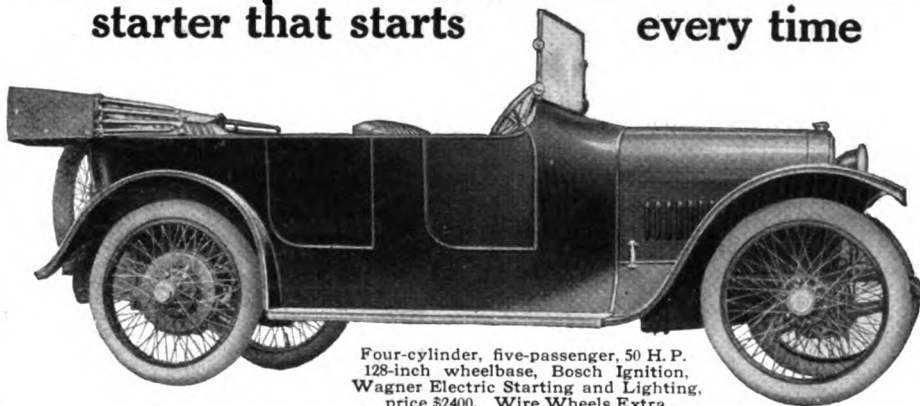


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# Moline-Knight

A big, roomy five passenger car with an electric starter that starts every time



Four-cylinder, five-passenger, 50 H. P. 128-inch wheelbase, Bosch Ignition, Wagner Electric Starting and Lighting, price \$2400. Wire Wheels Extra.

## The "Four" that makes the "Six" unnecessary

**Perfect streamline body** The streamline body of the Moline-Knight is graceful and smooth—the only genuine streamline body made in America. It is an extra large five-passenger body—with ample room for two extra seats for which it is ironed. It readily meets the need for either a five or seven-passenger car.

**As flexible and as powerful as any "six"** The Moline-Knight is equipped with the Wagner Electric Starting and Lighting System. The motor is a powerful four-cylinder 50 H. P. engine that is quieter, smoother running, more flexible and develops far more power than any six-cylinder poppet valve motor of near the same piston displacement, we have ever known.

**Enclosed, dust-proof** The unit power plant is entirely enclosed and protected against dust and dirt. It is carried on three point suspension. All operating and mechanical parts are quickly accessible—simply raise the hood, remove floor board and you have everything back to the universal joint in plain view.

If you believe you are entitled from your record to a contract for the Moline-Knight act at once. Right now there is a demand in your territory for the Moline-Knight—wire, use the phone or visit us at our factories. Get our "Advance Information Folder" immediately.

If you are a user and wish to know all about the wonderful new Moline-Knight—write us at once for our "Advance Information Folder."

**Moline Automobile Company,**

**100 Lillie St., East Moline, Ill.**



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# Overland

## \$950

*Completely Equipped*

*With electric starter and generator—\$1075*

*Prices f. o. b. Toledo*

Electric head, side and  
tail lights  
Storage battery and  
Ammeter  
35 horsepower motor  
114-inch wheelbase  
Timken bearings  
33x4 Q. D. Tires  
Cowl dash

Brewster green body with  
light green striping, nickel  
and aluminum trimmings  
Mohair top and boot  
Clear vision windshield  
Stewart speedometer  
Electric horn  
Flush U doors with concealed  
hinges

**T**HE 1914 Overland is the greatest self-seller in the industry. Few conceived, imagined or hoped that any factory could turn out for 1914 such a wonderful car at such a low cost.

And there was but one way to give the increased Overland value with decreased Overland price. Build more cars than competitors.

The 1914 Overland production is 50,000 cars—more cars of this type than is built by any other factory in the world.

That is why the value is increased and the price decreased.

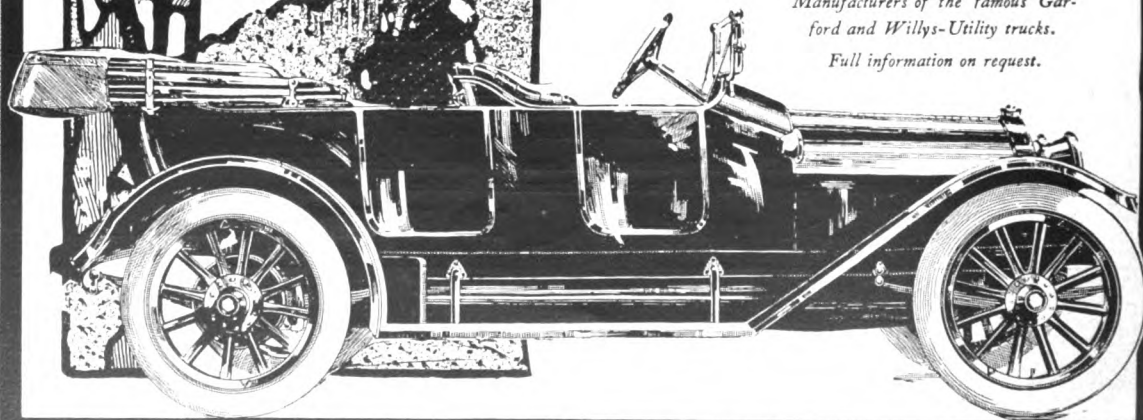
*Literature on request. Please address Dept. 53.*

### The Willys-Overland Co.

Toledo, Ohio, U. S. A.

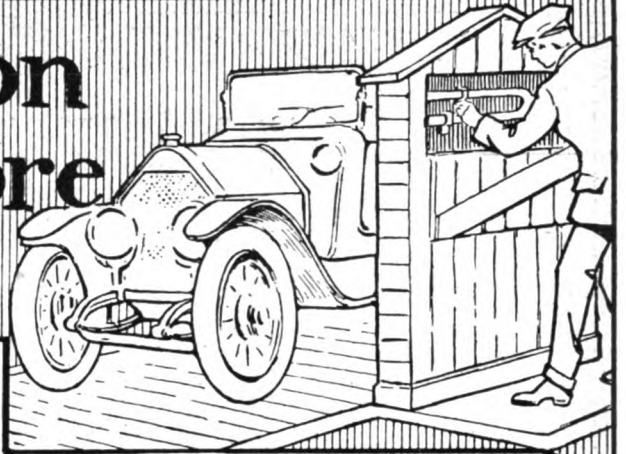
*Manufacturers of the famous Gar-  
ford and Willys-Utility trucks.*

*Full information on request.*





# Put the car on the scales before you buy it!



If you want to know how much weight electrical equipment has added to the 1914 car, before you buy it—

## Weigh It!

You're the one who will pay the tire bill, the fuel bills, the repair bills—***Weigh it!***

See that all the car's belongings are under the seats, water in the radiator and gasoline in the tank and then—***Weigh it!***

You don't have to take anyone's word for its weight—***Weigh it!***

If you want to know why the new car is sluggish, feeble on the hills, sudden death to tires and thirsty for gasoline—***Weigh it!***

Then compare the weight with a 1910 or 1911 model of the same car.

Electrical equipment adds a dead weight of 150 to 250 pounds and in addition (by actual tests) consumes 8% to 12% of the engine power.

This calls for larger engine, heavier frames, axles, springs, tires—added weight all the way through.

Either you'll find this or you'll find something worse—for if the manufacturer has not enlarged the engine and other parts to carry excess weight, the result is a weak, under-powered, overloaded car.

## If you want a real automobile

Full powered, simple, easier on tires, less troublesome, less expensive in every way—see that it is Prest-O-Lited.

Even if the car was designed to carry electrical equipment, the removal of the electric apparatus and the substitution of Prest-O-Lite will make a decided reduction in the weight, stop the power loss, and increase the safety, reliability and economy

If you want to know why—send for this book.

It shows why electric lighting costs five times more than Prest-O-Lite—how you risk the safety of yourself and family by an unreliable lighting system

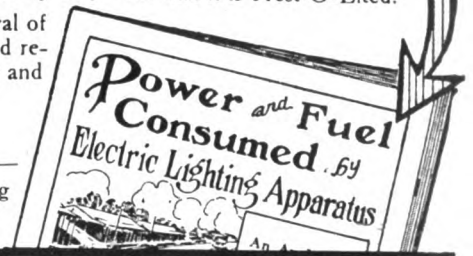
It tells why thousands of motorists are keeping their old cars and refusing to buy the new ones with electric equipment.

**The Prest-O-Lite Company, Inc.,** 226 Speedway, Indianapolis, Ind.

(Contributor to Lincoln Highway)

Prest-O-Lite can be lit, dimmed and extinguished from the driver's seat. It is the natural solution of your lighting troubles.

EXCHANGE AGENCIES EVERYWHERE.



## USE THE COUPON

PREST-O-LITE CO., Inc.,  
226 Speedway, Indianapolis, Ind.

Please send full information on ALL lighting systems to

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## So Much Depends Upon the Starting-Lighting System

Have you ever considered that the actual performance of any modern car depends upon the ability of the starting-lighting system?

If the starting device will not crank the engine under all weather conditions, if it is not efficient, reliable, and consistent in operation—the actual value of your car is reduced at least one-half.

If the lighting dynamo does not offer every convenience, if it does not provide maximum illumination—no matter how you operate your car or when—the conveniences you are entitled to are not available.

When purchasing an automobile, bear in mind the well-known efficiency of the

## Gray & Davis Starting-Lighting System

In this system you obtain great power—power sufficient to meet every cranking requirement. You have at your disposal maximum illumination. You are not restricted by conditions and you have the satisfaction and assurance of operating a time-tried and service-tested system which has successfully met the public demand for starting-lighting efficiency.

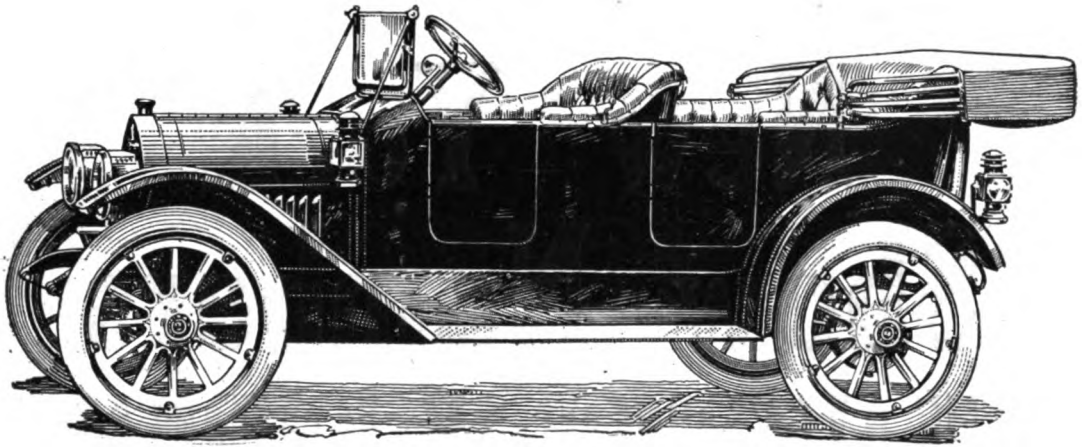
An inspection of the many cars carrying this equipment is invited. Cars ranging in price from \$1075 to \$7000 are so equipped.

*We shall be pleased to forward  
catalog and full information*

**GRAY & DAVIS, Inc., BOSTON, MASS.**

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# EMPIRE

*"The Little Aristocrat"*

Completely Equipped

## Now \$900

New Series Model 31 Empire, for the Season of 1914

*A larger, more beautiful car with every luxury and equipment*

Basic principles of design and construction unchanged; severest tests and hundreds of thousands of miles prove them right. *But a score of refinements and improvements* are incorporated in the new series Model "31" EMPIRE for 1914 that make it still a better car than last season's EMPIRE, and it sells for less.

*Quadrupled output and quantity buying enable us to add to the beauty, size and value of the car and yet to reduce the price by fifty dollars—the biggest value yet offered to dealers and automobile buyers.*

Dealers, there remains some open territory. Our broad, liberal sales plan offers a rare opportunity for a permanent connection. Tomorrow may be too late to secure territory.

**Completely Equipped \$900 Including**

Demountable Rims  
Mohair Top  
Top Envelope  
110" Wheel Base

Unit Power Plant  
Rain Vision Windshield  
Tool and Tire Kits  
Extra Rim

Stewart Speedometer  
Prest-O-Lite Tank  
Gas Headlights  
Oil Side and Tail Lamps

Eisemann Magneto  
Double Tire Irons  
Oil Sight Feed  
Dash Air Adjustment

**Write for Our Advance Catalogue for 1914 and for a Copy of Our Illustrated Transcontinental Empire Tour Book**

# EMPIRE AUTOMOBILE COMPANY

448-50 N. Capitol Ave., Indianapolis, Ind., U. S. A.



# **New York Show Numbers**

## **THE AUTOMOBILE JOURNAL**

**Advance---December 25, 1913**  
**Review---January 10, 1914**

Manufacturers of Motor Vehicles and Accessories Must Reach the People Who Will Attend This Display.

It Is Held in the Home Field of The Automobile Journal, the Most Widely Read Owner's Motoring Magazine Published in America.

We Offer the Right Clientele, in the Right Territory and at the Right Time.

**Make Your Reservation of Space At Once**

**THE AUTOMOBILE JOURNAL PUBLISHING CO.**

**Times Building**

**PAWTUCKET, R. I.**



# Cut This Out and Save It

Paste it on tin or card-board and hang it in your garage.

## WHERE TO USE

### Dixon's Graphite Automobile Lubricants

**TRANSMISSION.** Use No. 677 for all transmissions that use grease. Use No. 675 for all transmissions that are intended for oil lubrication. Use No. 688 only in gears that are noisy or in housings that leak. Must be thinned at least 50% with No. 677.

**DIFFERENTIAL.** Use No. 677 in all differentials with shaft drive, also in chain driven cars that use grease in the differential. Use No. 675 in the differential of chain driven cars that are intended for oil lubrication. Use No. 688 for noisy gears and leaky housings. Must be thinned at least 50% with No. 677.

**TIMING GEARS.** If there is no connection with crank case, use No. 677; otherwise use oil with a little Motor Graphite added. If grease can be used and gears are noisy, use 50% No. 677 and 50% 688.

**UNIVERSAL JOINTS.** Use No. 676 or Cup Grease No. 5. Will not throw out.

**PUMP CUPS.** Use No. 676. Will not melt and run into the radiator.

**OVERHEAD VALVE CUPS.** Use No. 676. Is not affected by the heat.

**THRUST COLLARS.** Use No. 676. Is not affected by heat.

**CUPS elsewhere than on engine.** Use Cup Grease No. 3 in Winter. Use Cup Grease No. 5 in Summer. In warm climates use No. 5 all the time.

**WHEEL SPINDLES.** Use Graphitoleo, but Cup Grease No. 3 or No. 5 may be used if Graphitoleo is not obtainable.

**ENGINE.** Use Motor Graphite in splash systems only. Add an even tea-spoonful of Motor Graphite to each quart of oil contained in the crank case. Add another tea-spoonful of Motor Graphite to each third quart of oil put in crank case thereafter.

**CHAINS.** Use Motor Chain Compound. Clean the chain—melt the brick of Motor Chain Compound—boil the chain in the Compound for 20 minutes or  $\frac{1}{2}$  hour—let chain cool. You then have on every pin in the chain a graphite bushing that will not squeeze out—the outside of the chain is well lubricated, but is dry and hard, and will not pick up grit.

Made in JERSEY CITY, N. J., by the

## Joseph Dixon Crucible Company

ESTABLISHED 1827

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## FOR SALE

Automobile Garage and Machine  
Repair Shops of seven thousand  
square feet floor space for sale.  
Running at full capacity. Great op-  
portunity for live automobile man.  
Write Peninsula Auto & Garage Co.,  
3208 Washington Ave., Newport  
News, Virginia.

**When Buying  
and Selling  
REMEMBER  
That The  
Accessory and  
Garage  
Journal**

Reaches More Buy-  
ing and Selling In-  
terests than any  
other Magazine  
that is devoted to  
the Automobile and  
Allied Industries.

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Distribution Is  
12,000  
Monthly  
All Trade**

**December Issue  
NEW YORK  
SHOW NUMBER**



# Kemco

## Fan Type Electric Generator      Built on Scientific Principles



**The Kemco is a Generator and Fan Combined**—One that can be installed in an hour without tearing down the car. Waterproof and dustproof. Can be put on any make of car at less cost than other generators. Your old fan comes out. A **Kemco** generator, with fan attached, goes in its place. The **Kemco** generator weighs only 4 pounds more than the standard fan. It charges batteries and gives ample current for electric lights.

**The Kemco Is Easily Installed**—No place to attach a generator has kept thousands of car owners from enjoying the convenience of electric lighting, starting, etc.

In some cars every moving part is covered by housing; making it impossible to attach a generator in place of the ordinary type.

The **Kemco** is installed in the one practical location—"just the place for a generator."

In connection with its cooling features a dependable source of current supply is furnished.

Power which operates the fan does double duty, and charging current is obtained at little or no cost.

Installation requires no changes in the car—you simply substitute a **Kemco** fan-type generator in place of the fan you are now using.

On many cars the **Kemco** can be installed upon the original fan supports, but when any additional fittings or a bracket are necessary, we can furnish them.

**The Kemco Is Inexpensive and Easily Attached to Any Make of Car**—It does not carry with it a big bill for labor of installing. Your car is not "tied up" to make the change. First cost means all the cost. A **Kemco** adds more than its cost to the value of a car. A car equipped with **Kemco** and storage battery can have lights whether running or standing.

**What the Kemco Does**—It furnishes current for charging your battery—ample to operate any combination of lights, an electric starter, gear-shaft, horn, ignition or other electrical devices. It is admirably suited for battery charging, because it gives an ample supply with no danger of overcharging at high speeds.

**Kemco Equipment and Guarantee**—Few parts and no complications, electrical or mechanical, make the **Kemco** especially suitable for automobile service. We furnish the following material for equipping the average car: **Kemco** fan-type generator complete. Automatic cutout and ampere meter. Fan-bracket when required. Every generator is thoroughly tested, and all **Kemco** products are guaranteed against electrical or mechanical defects for one year.

**The Kemco Electrically**—The armature is ring-shaped and rotates outside the fields. This construction produces rapid radiation of any heat through the fan blades and outside casing.

The practical result is high current output and a compact, strong machine of light weight.

The **Kemco** generates its normal output at low and medium speeds—at high speed the output rapidly decreases. This regulation is accomplished by the generator's construction, making the **Kemco** ideal for battery charging.

The **Kemco** is the only generator, the output of which is not affected by heat conditions.

**The Kemco Mechanically**—Every part of the generator is strong and substantial. Brush construction provides more contact surface than is found in any automobile generator, and gives brushes an average life of 50,000 miles running.

Accessibility is a most important quality. The entire fan and generator can be dismounted in 10 minutes. No changes in the fan-belt are required.

**Kemco Representatives Wanted in All Centres**—Ours is a money-making proposition. Write today.

# THE KEMCO ELECTRIC MFG. CO.

2229 Ashland Road  
Cleveland, Ohio.



## PUBLISHER'S COMMENT.

The Fourteenth Annual Automobile Show will be held in the Grand Central Palace, New York City, under the auspices of the Automobile Chamber of Commerce, Jan. 3-10. There are only two national exhibitions held each year by the manufacturers of pleasure cars and their accessories. The importance of the East as a market for motor vehicles is indicated by the fact that the industry awaits the opportunity afforded by the annual New York display to reveal the new features in the various lines. The issue of The Automobile Journal for Dec. 25 will be known as the advance New York Show Number and will be replete with information concerning what may be seen at that exhibition. The issue for Jan. 10 will be the Review Number, in which special reference will be made to the new cars and accessories shown for the first time. The two numbers combined will constitute a buyer's reference and guide for the 1914 season. Make certain that you do not miss them by entering your subscription at once. Order direct, or through your news dealer.

**Make Your Motoring Friends Happy** with a Christmas gift that will last all the year. The Automobile Journal is an owner's magazine, and as such, every issue is filled with exactly the information that the automobile owner is seeking. A year's subscription costs but \$1, and with each order received to be filed as a Christmas present we will forward a neatly prepared gift card, fittingly inscribed with the donor's name, to reach the recipient Christmas morning.

**Our Series of Mechanical Handbooks** would be particularly appreciated by any young man who is desirous of familiarizing himself with the mechanical details of motoring. They are written in an interesting, non-technical manner, and fully illustrated, so that the novice is able to understand the facts presented. The price for the set of 10 books is \$3.75, or with a year's subscription to The Automobile Journal, \$4.75.

**The Buyers' Guide on Pages 103-112**, contains the names and addresses of reliable concerns engaged in the manufacture and sale of pleasure and commercial cars, and their accessories, supplies and fittings. Always consult it when in need of anything new.

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# For Purchasers of Motor Cars— and for Dealers—Here are Certain Economic Facts of Vital Interest and Importance.

**IT** is quite generally known that the Paige Car is a car of extra value for the money.

Many men—thousands of them doubtless—who **realize** this is so, do not understand **how** it can be so.

Many who admit that the Paige **seems** to be the greatest car in the world at its price are skeptical because they don't see **how** the Paige Company can possibly have such advantages over competing manufacturers as to **permit** the production of so much better cars.

So here, then, is a simple, brief statement of five fundamental facts which tell you why this **can be and is so**.

**FIRST FACT**—Small capitalization. Only \$250,000. And the Paige Company seeks nothing more than moderate dividends on this small capitalization. Every dollar earned above these moderate dividends *goes back into the car*. You can prove this yourself. Compare the 1914 Paige with the 1913 Paige. Compare the 1913 model with the 1912. The proof is clear.

**SECOND FACT**—No preferred stock and no "water." The Paige Company's capital is all *genuine*. No "patents, good will and valuable trade names" to pay dividends on. The stock is all *common* stock. No deferred dividends accumulating if it does not seem advisable to pay dividends.

**THIRD FACT**—Not a dollar's worth of bonded indebtedness to add a 6 per cent or 7 per cent load that the *car purchaser* must pay. The Paige Company carries *no* financial load. It is *financially free and independent*.

**FOURTH FACT**—Our investigations show that we operate at the *lowest "overhead" expense*. How? By simplicity and economy in management. By good old-fashioned Hard Work. No branches. Absolutely mod-

ern factory equipment. Our great new factory is the very last word in automobile plants.

**FIFTH FACT**—By sufficiently large production—13,500 cars for 1914—coupled with financial strength and highest credit, to earn lowest prices on all materials and parts, and to *command* the best.

The famous Paige "36" for 1914 is even *further* ahead of its competitors than the "36" of a year ago was.

## Features of Design, Construction and Equipment

A really big, roomy car; 116-inch wheel base; left side drive and center control; powerful, quiet, long stroke 4x5-inch Paige motor, unit power plant; silent chain drive for cam shaft, pump and generator; perfect and smokeless lubrication; gasoline supply carried under a shroud dash, with short straight feed from tank to carburetor; multiple disc cork insert clutch; aluminum castings for strength and light weight; extra-deep cellular radiator and extra-large fan and water jackets; crowned fenders; deep tilted 10-inch cushions and a score of other features of design and construction.



Paige "36" equipment, in every detail, from starter to tail lamp, is all of the highest class. It includes the Gray & Davis large unit electric starting and lighting system; ventilating windshield built into body; silk mohair top, tan lined; jiffy curtains; Stewart revolving dial speedometer; 12-inch electric head lights; electric side lights flush in dash; 5 demountable rims; Goodyear, Goodrich or Diamond tires, with non-skid in rear; Bosch magneto; adjustable foot rail; nickel robe rail; extra tire irons; license brackets; electric horn; pump, jack, tools, tire repair outfit, etc., complete.

Touring car \$1275, 3-passenger roadster \$1275, 2-passenger speedster \$1275, 4-passenger coupe \$1850, 5-passenger Sedan \$1950, limousine \$2250.

See the Paige at the Shows. There is some desirable territory open. For further information, write or wire,

## PAIGE-DETROIT MOTOR CAR COMPANY

306 Twenty-first Street

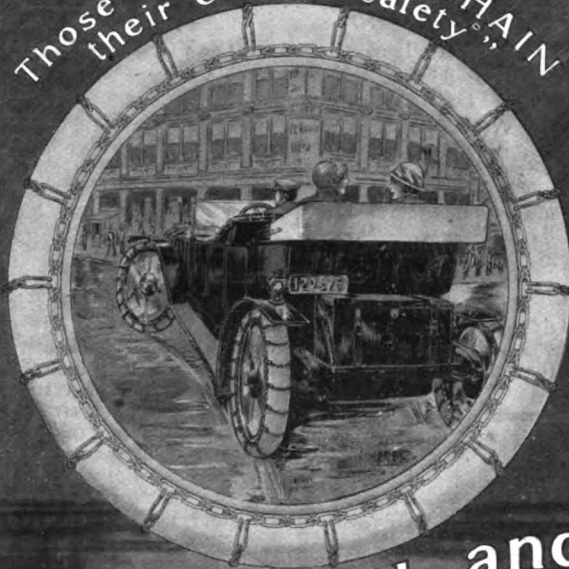
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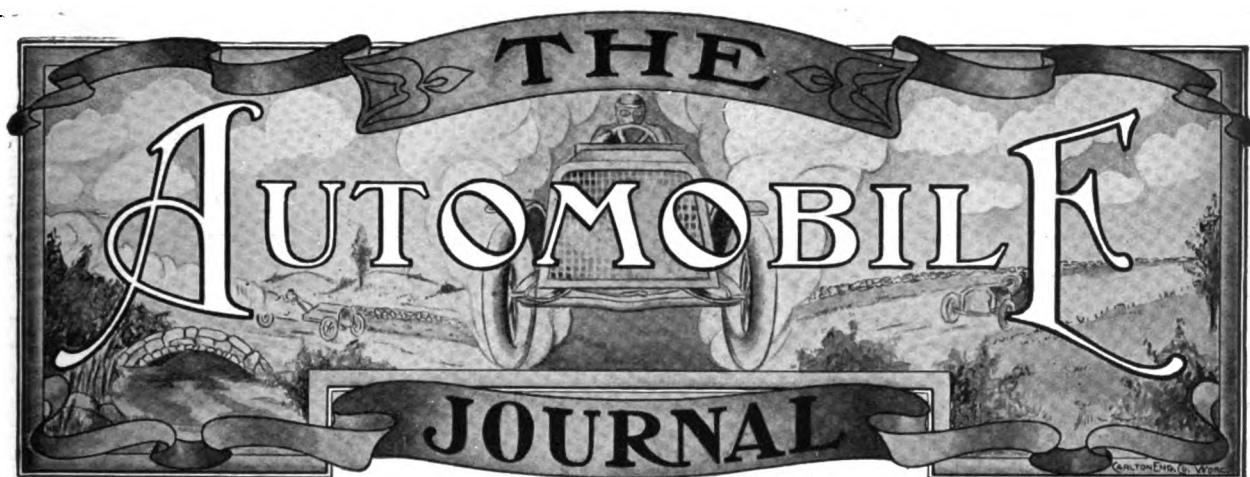
**WEED CHAIN TIRE GRIP COMPANY, 28 MOORE STREET, NEW YORK, N.Y.**

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VOL. XXXVI, No. 8

NOVEMBER 25, 1913

Price, \$1.00 the Year

## NEW ENGLAND BUSINESS OUTLOOK GOOD.

**An Analysis of the Conditions Governing the Sale of Cars in This Territory—  
How the Boston Dealers View the Prospects for the 1914 Season.**

**F**ROM the very inception of the automobile industry in this country, Boston has played a prominent part in its history. Particular reference is made at this time to that history dating from the establishment of the industry upon any-

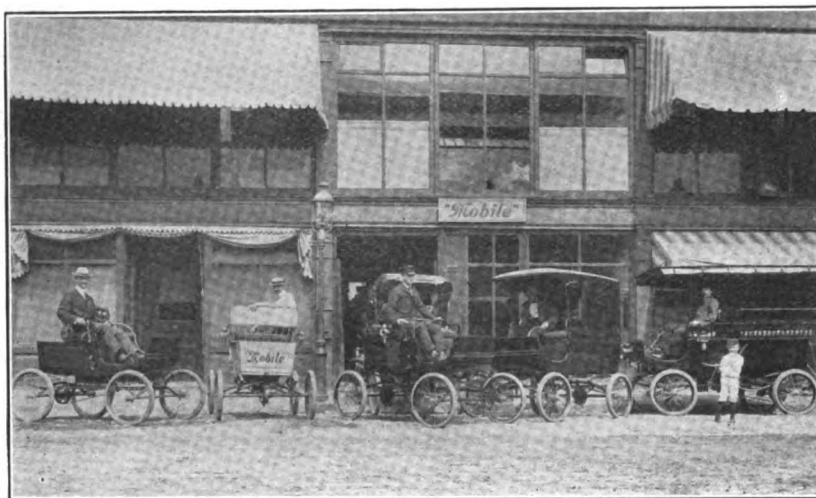
thing even approaching a commercial basis. Undoubtedly, experimentation with the horseless carriage covered a longer period than has ever been acknowledged by those who were able to bring their experiments to a successful issue. It also is probable that such vehicles

were publicly exhibited before George H. Morrill of Norwood, Mass., appeared on the streets of Boston driving one of the original models produced by Charles E. Duryea, which was preceded by a flagman to warn other high-

way users, some time in the latter part of 1893.

That Mr. Morrill was able to travel from place to place in his horseless carriage was a feat which occupied the minds and attention of many Boston people. In 1895, Kenneth Skinner of

Boston imported the first gasoline vehicle, a De Dion tricycle, and soon afterward interested Thomas McCullough, who had a small shop on Massachusetts avenue, near the corner of Boylston street, in the production of machines utilizing motors of this type. Several other ex-



**The First Salesroom in America Devoted Exclusively to the Exploitation of Automobiles—The Mobile Factory Branch, Opened at 346 Boylston Street, Boston, in the Fall of 1898.**

perimenters were inclined to meet and discuss the horseless carriage in McCullough's shop, and as a result this soon came to be known as "Automobile Headquarters".

It thus will be understood that this term origi-



inated before its application in a corporate way to a garage opened by P. A. Lewis on Stanhope street in 1900. And, by the way, George Reed and A. P. Underhill, under the firm name of Reed & Underhill, opened an agency for Knox cars in this structure in 1901. Undoubtedly, there were still other "Automobile Headquarters" in Boston during the intervening period.

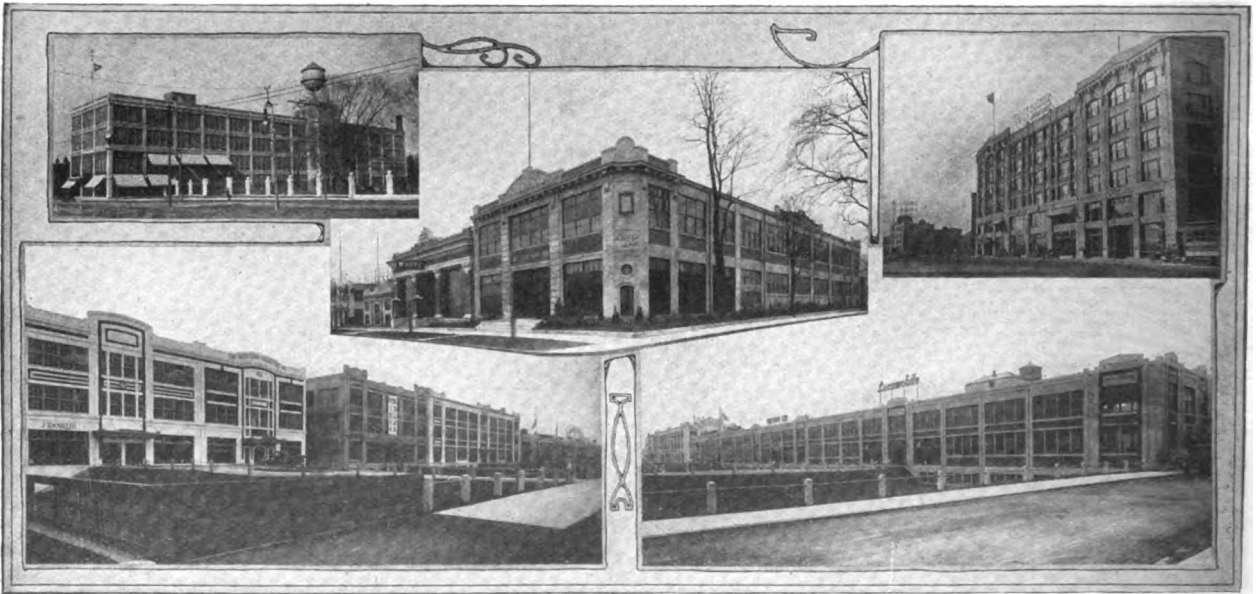
#### America's First Salesroom.

But to return to McCullough's shop: One of the enthusiasts foresaw a splendid future for the new industry and rented a building on Boylston street in which to conduct an automobile salesroom. This was in 1898. Among those whom he sought to represent was the maker of the Mobile steamer, then being produced at Tarrytown, N. Y. When the matter was brought to

racycles maintained by Kenneth Skinner. There does not seem to be any doubt, however, that it was the first factory branch and the first salesroom devoted solely to the exploitation of the automobile. The photograph from which the accompanying illustration is reproduced, probably was taken early in 1900, and the view shown is the rear of the store, because the traffic rules of the City of Boston forbade entrance to the building by automobile from the front. The salesroom was opened during the fall of 1898.

#### Prominence of Boylston Street.

This bit of automobile history is of exceptional interest in the light of recent events in Boston. The location of this store on Boylston street did not exactly establish that thorough-



Glimpses of Boston's New Automobile Row on Commonwealth Avenue: Upper Left, Packard Plant; Upper Centre, Group of Buildings Near Allston Line; Upper Right, Square at Beacon Street; Lower Views Present Both Ends of the Long Block of Buildings Near the Beacon Street Corner.

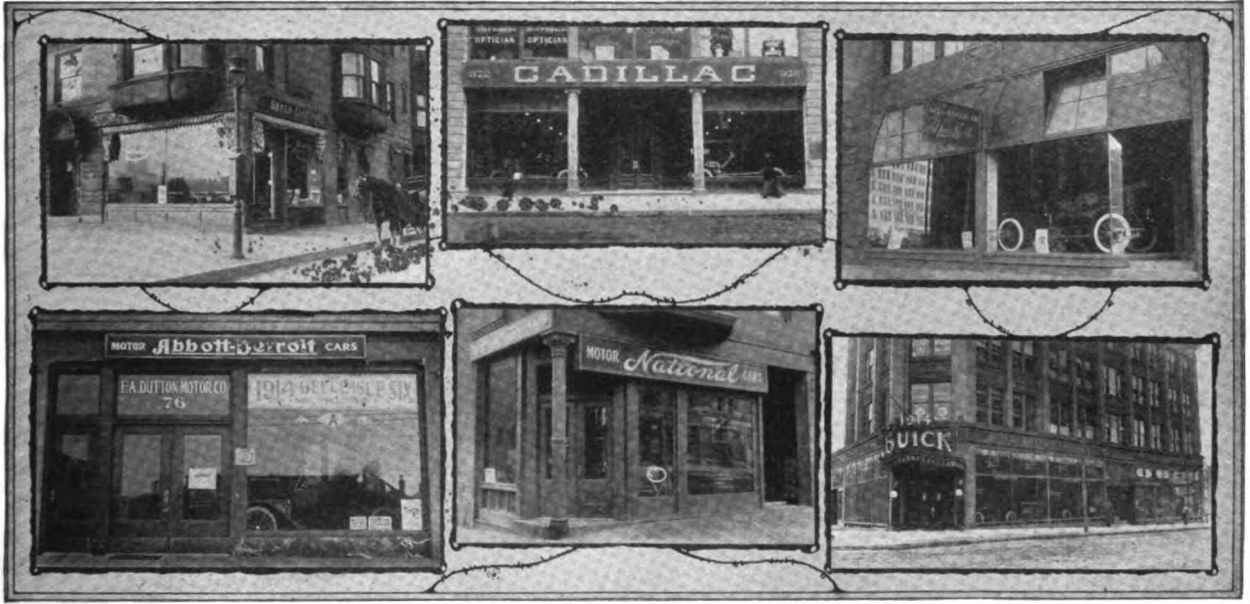
the attention of John Brisbane Walker, who was interested financially in the manufacture of these cars, it was decided that if the proposition looked good enough for others, the company could well afford to operate its own sales agency, and Harry Fosdick was sent to Boston to open a store.

It is expected that the claim that this was the first automobile salesroom opened in this country will be questioned. John Wanamaker was displaying Mobile steam cars in his New York store about this time, and there is some dispute, apparently, as to whether his agency antedated that opened in the store at what was then 346 Boylston street, in Boston. And, of course, there was the agency for De Dion tricycles and quad-

fare as the Automobile Row of that city, but the fact remains that until within the past year that portion of Boylston street between Copley square and Massachusetts avenue has been given over very largely to cars and accessories.

It already has been pointed out that some of the earlier agencies were on Stanhope street, and others were on Columbus avenue. Mention should be made of the creation of an automobile centre in the Motor Mart, at the foot of Columbus avenue facing Park square. The overflow from Boylston street has extended onto Massachusetts avenue, on both sides of Boylston, and on Huntington avenue, between Massachusetts avenue and Copley square. Still other agencies



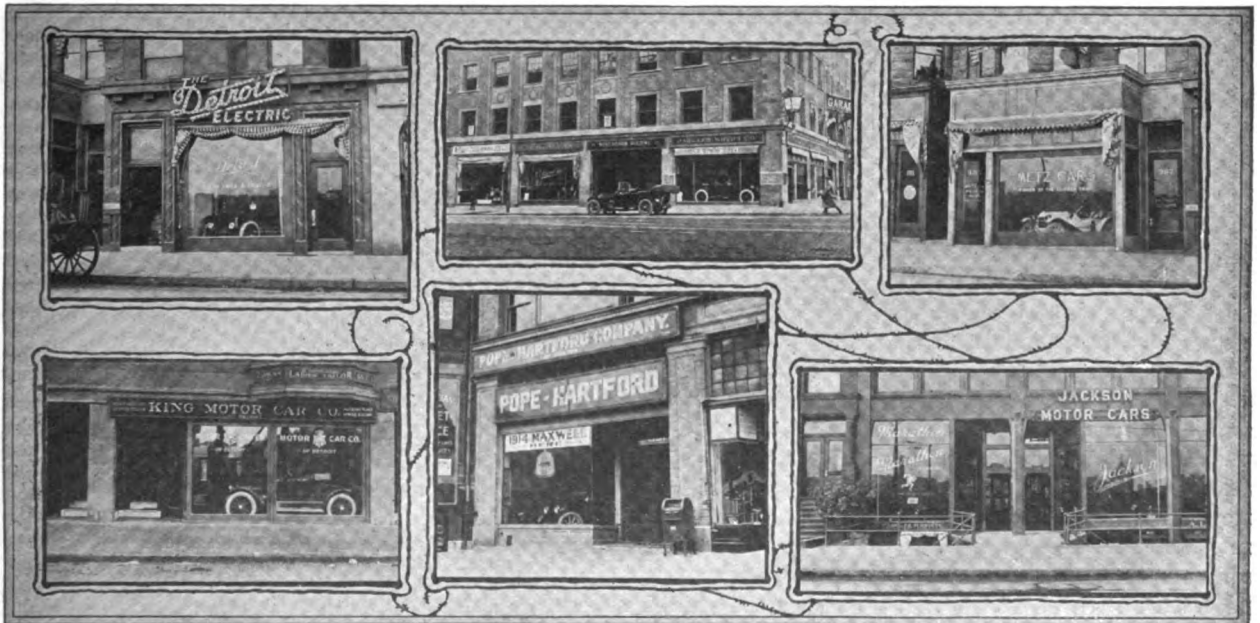


Upper Row, Left to Right: Baker Electric and Cadillac, Boylston Street, and Speedwell, Columbus Avenue—Lower Row, Abbott-Detroit, Huntington Avenue; National, Boylston Street, and Buick and Stevens-Duryea on Massachusetts Avenue.

and branches were located at various points about the city.

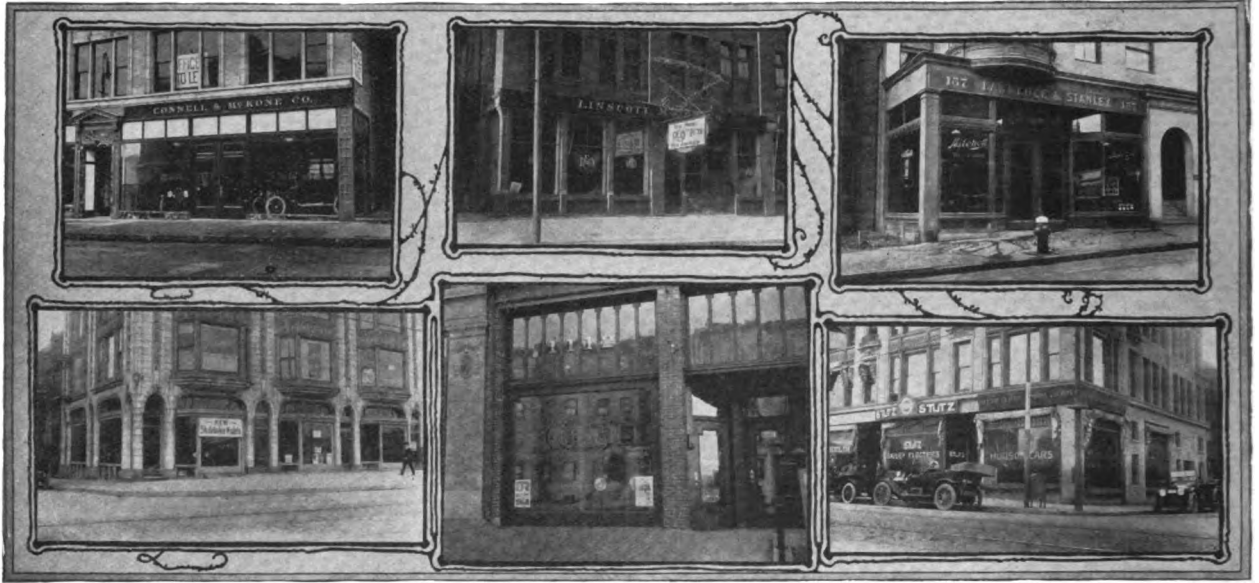
Some two or three years ago the Autocar Sales & Service Company, a factory branch of the concern making Autocar business wagons, opened its salesroom and service station on Beacon street, near the corner of Commonwealth avenue, and the Packard Motor Car Company of

Boston (Alvan T. Fuller) erected a large service station at Brighton and Commonwealth avenues, over the Allston line. Fuller retained his salesroom in the Motor Mart until the present year. The Peerless Motor Car Company of New England, factory branch, also located at Beacon street and Commonwealth avenue about the same time as the two others already mentioned above.



Upper Row, Left, Detroit Electric, Boylston Street; Centre, Cole, Stearns and Oakland, Massachusetts Avenue; Right, Metz, Boylston Street—Lower Row, King, Pope-Hartford and Maxwell, and Jackson and Marathon, Boylston Street.





**Upper Row, Left, Overland, Massachusetts Avenue; Centre, Reo, Columbus Avenue; Right, Mitchell, Massachusetts Avenue—Lower Row, Studebaker and Knox, Cameron and Cartecar, and Stutz, Bailey Electric and Hudson, All on Boylston Street.**

These buildings formed the nucleus of a new Automobile Row, which now extends from the Autocar to the Packard plants—a distance of practically two miles. It should not be understood that there is a solid block of automobile buildings throughout the entire distance. Four motor car and two tire concerns are located on the square at the corner of Beacon street and Commonwealth avenue. Then there is a gap of something like a city block, after which 10 automobile companies are housed in a row of buildings over a quarter of a mile long. Half a mile further up the street is a third section, in which are to be found six car agencies and several other concerns intimately associated with the automobile industry, such as body and top makers, etc. It is still some little distance to the Packard plant, and ground already has been broken for other buildings of a similar character.

#### **Unlike Anything Else.**

In some respects Boston's new Automobile Row is unlike any other in the world. Each of the buildings was designed and constructed solely for automobile purposes. Many of them are small factories in themselves. This feature is sufficient indication of the wonderful growth of the industry in New England's business centre, but there are other phases of the situation which will interest the motorist.

With but three exceptions the concerns which have removed to Commonwealth avenue have discontinued their salesrooms further down town. One of these exceptions is the Cadillac agency,

the salesroom of which has been located at 372 Boylston street, near the Public Gardens, for years. The others are the Studebaker agency and the Buick branch. It will be understood that the Commonwealth avenue buildings for these cars are service stations only, but with all the others, the salesroom and service station are combined under one roof.

#### **Reasons Which Compelled Change.**

Why did these concerns abandon their locations in what has been looked upon as at least a portion of the business section of Boston and create a new business section on one of the finest boulevards in the city, famed hitherto for its handsome residences, and so far out of the city proper that many of the buildings are taxed in towns which go to make up Greater Boston? There were several reasons.

The advantage of being on a trunk line thoroughfare was considered, and there is no place in Boston where so many automobiles pass a given point during a single day, unless it be that section of Commonwealth avenue lying below Beacon street, which is devoted to residential properties and hotels. The item of rent also was of importance, and the advisability of having the service station in close connection with the salesroom.

#### **New Business Methods Adopted.**

It must be conceded that many of the business methods of the industry have undergone decided change. This applies to both manufacturer and dealer. Many of the pioneer dealers in



Boston, and therefore in America, are still in business in that city. They are not only well informed as to local conditions, but they have learned from actual experience the methods which make for individual success. This does not mean that there are no differences of opinion, a fact which is substantiated by the erection of large service stations in the vicinity of the old Automobile Row on Boylston street. A specific instance is the four-story Overland station now in process of construction at West Newton, Falmouth and Belvidere streets.

#### Owners Sell Cars.

The older dealers, at least, bear in mind that the day is gone by when the public was so eager to possess automobiles, that the prospective purchaser paid frequent visits to the salesroom to gain information concerning the various models and to urge more rapid delivery. Insofar as Boston is concerned, and undoubtedly the same conditions apply elsewhere, the selling of motor vehicles has become very largely a matter of soliciting business. That is to say, the salesman must canvass prospects and seek to interest them sufficiently in his car to make a demonstration possible.

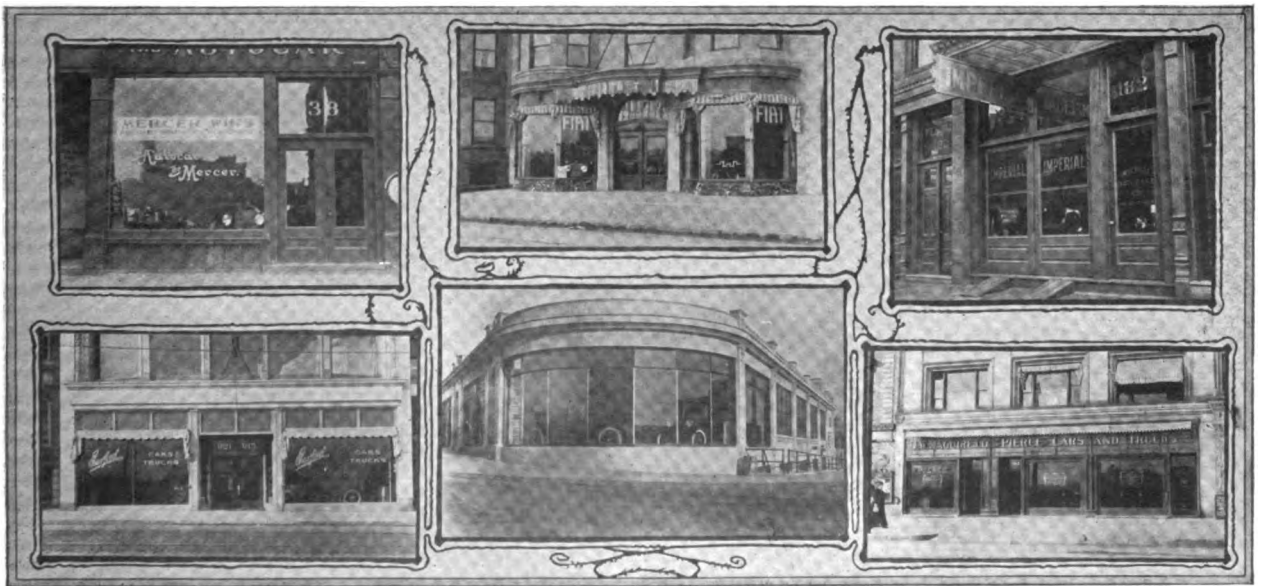
This creates a situation as a result of which it is contended by many that it matters little where the salesroom is located, since customers must be brought to the dealer. On the other hand, some maintain that more prospects visit the new places on Commonwealth avenue than was true when the salesrooms were further down

town. Of course these opinions are not held by those who still remain in the older locations.

Even among those who feel that it is necessary to solicit business today, there is a suggestion that the buying public is still sufficiently interested in automobiles to visit the dealer were it possible to secure limited display space in the heart of the business district—room for one car, for instance—say at the lower end of Washington street. Busy men find little time to consider extraneous matters during business hours, and it is at such times that the solicitor must do his work. Even very busy men usually take opportunity to secure a respite from business cares during the lunch hour, for instance, and it is thought that they would gladly avail themselves of the opportunity to inspect the models on display in a down town showroom of the character suggested. However, this plan involves additional rent expense, and with the business methods in vogue among Boston automobile dealers today, innovations are not attempted until the conditions warrant.

#### Used Car Problem.

The matter of used cars causes more or less discussion in every community. Boston dealers have not solved this difficulty, although some of them state that they have, insofar as they are concerned individually. Several agents sell only for cash. That is to say, they will not trade, although they may be induced to take part of the payment in stocks or bonds of good standing. If the prospective purchaser has a car which he de-



Upper Row, Mercer, Columbus Avenue; Flat, Boylston Street; Imperial, Columbus Avenue—Lower Row, Garford, Boylston Street; Henderson, Brookline Avenue; Pierce-Arrow, Boylston Street.



sires to sell, the dealer will secure the best possible price for him, but in each instance of this nature the full purchase price of the new machine is paid, and the amount realized on the old car is turned over when that sale has been consummated.

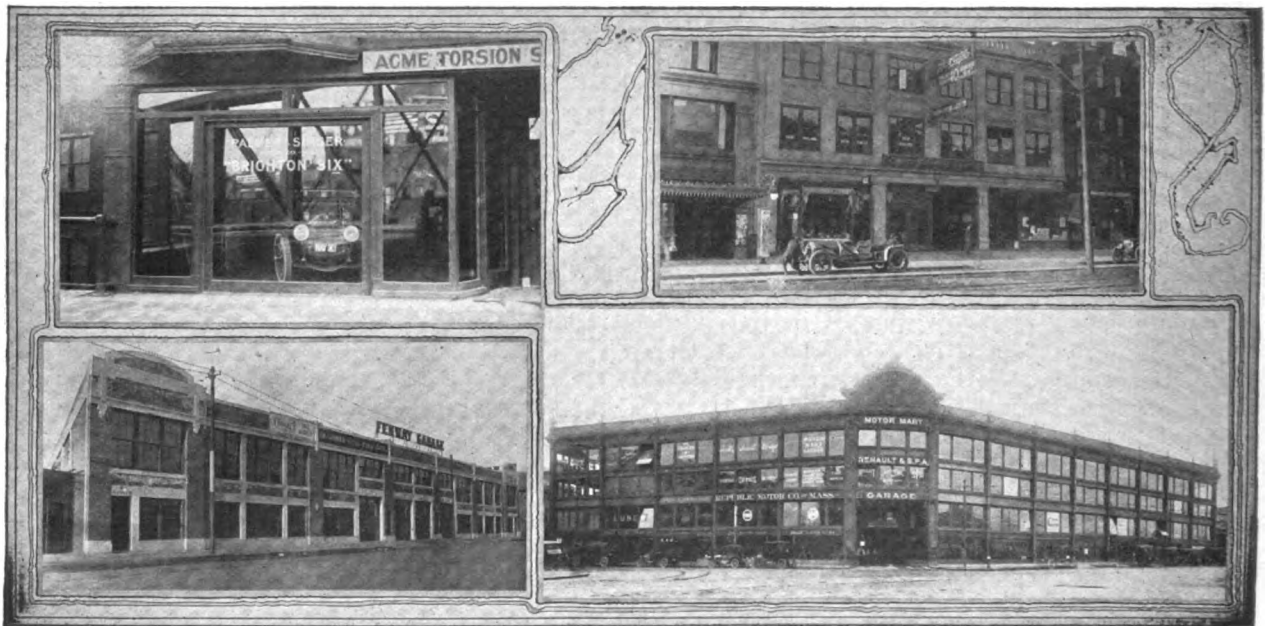
Other dealers maintain that it is absolutely necessary to make trades, and in many instances the competition is very keen. Whether or not there is any evidence to substantiate the claim, it is held by some agencies that it is possible for a factory branch to take advantage of the dealer by offering larger discounts in a trade, the factory being in a position to balance the sales in Boston against those in other sections.

With the situation as outlined above, it is

propositions over to a disinterested party. Still another reason for considering this move is found in the difficulty attendant upon disposing of used cars. To the necessity for making two sales instead of one must be added a still more important factor. The dealer who disposes of a second hand car of a make other than that which he represents must see that the machine gives satisfaction or run the risk of losing a business friend, and if it does give satisfaction the chances are very much in favor of his having created additional customers for a make of car represented by a competitor.

#### The Electric Situation.

No attempt has been made herein to differentiate between passenger and commercial vehi-



Upper Row, Palmer-Singer, Boylston Street, and McIntyre and Imp Cyclecar Agency in Taylor-Palmer Garage on Huntington Avenue; Lower Row, Fenway Garage, Ipswich Street, Home of Chandler and Paige Agencies, and the Motor Mart.

conceded without question that many times it is the owner who makes the sale rather than the dealer or his salesman. The prospective purchaser makes inquiry among his friends and is guided very largely by their opinions in making his selection, particularly if it is his first machine. This is cited as a very potent reason why manufacturers are anxious to place as many cars as possible in a given territory.

#### A Possible Solution.

Undoubtedly, this has played its part in creating a condition, insofar as trading is concerned, both with respect to the factory branch and agency, that raises the question as to whether it would not be possible to turn all second hand

cles, although there is little doubt that the situation cannot be made to apply to both in exactly the same manner. Each line might be subdivided between gasoline and electric machines, and again the conditions would not be identical. It has seemed more desirable to consider the subject in a general way.

However, the electric pleasure car market in this field has been given particular attention during the past year, with the result that the number of such vehicles in use in metropolitan Boston has been increased practically 92 per cent. Those who are directly interested in this exploitation have just concluded a most successful exhibition, as set forth elsewhere in this issue,



# DIRECTORY OF PROMINENT BOSTON AUTOMOBILE DEALERS.

**Anderson Electric Car Company**, 903 Boylston street; Detroit electric; factory branch. Manager, Albert Weatherby; salesmen, Russell Bennett, J. Leslie Brown, E. R. Harris, N. M. Hammond.

**S. R. Bailey & Co., Inc.**, 895 Boylston street; Bailey electric; Boston sales office. Vice president and sales manager, John S. Codman; salesmen, P. E. Whiting, G. W. Langdon.

**E. P. Blake**, 169 Huntington avenue; McIntyre and Imp cyclecar; agency.

**J. W. Bowman Company**, 91 Massachusetts avenue; Stevens-Duryea, S. G. V. and Waverley electric; agency. President, A. W. Klein; treasurer, J. W. Bowman; secretary, M. H. Harper; salesmen, G. A. Canterbury, B. A. Robey, J. A. Davis.

**Buick Motor Company**, 97 Massachusetts avenue; Buick; factory branch. Manager, H. L. Johnson.

**Cadillac Automobile Company of Boston**, 372 Boylston street; service station, 660 Commonwealth avenue; Cadillac; agency. Proprietor, Alfred Measure; sales manager, G. M. Leghorn; manager service department, J. J. McGregor; superintendent service department, Louis F. Russell.

**J. I. Case Threshing Machine Company**, Motor Mart; Case; factory branch. Manager, E. E. Beyer; salesman, J. J. Gormley.

**Chandler Motor Car Company of New England**, Fenway garage, Ipswich street; Chandler; agency. President and general manager, R. B. Nettleton; vice president and sales manager, George A. Crittenden; treasurer, E. G. Cleary; salesmen, Arthur W. Mutty, E. M. Rogers, R. P. Holmes.

**Chevrolet Motor Company of New England**, Motor Mart; Chevrolet; factory branch. Manager, W. C. Sills; salesmen, T. W. Keefe, W. F. O'Brien, H. F. W. Rasmussen.

**Cole Motor Car Company of Boston**, 94 Massachusetts avenue; Cole; agency. Manager, A. C. Banker; salesmen, Conrad A. Smith, Kenneth P. Smith, D. P. Callahan, G. E. Habich.

**Connell & McKone Company**, 167 Massachusetts avenue; Overland; agency. President, W. J. Connell; vice president and treasurer, J. L. McKone; sales manager, W. P. McKone; superintendent service station, Harry Wilmarth; salesmen, W. E. Chandler, A. J. Dorley, W. D. Porter, F. D. Pierce.

**Curtis-Hawkins Company**, 162 Columbus avenue; Speedwell; agency. President, George E. Curtis; secretary and treasurer, Paul R. Curtis.

**Donovan Motor Car Company**, 889 Boylston street; Studebaker; agency. President and manager, Joseph S. Donovan; secretary, Frank B. Donovan; salesmen, Francis F. Coveney, Clayton V. Sawyer, Charles E. Kelley, R. P. McShane, J. C. Sargent.

**F. A. Dutton Motor Company**, 76 Huntington avenue; Abbott-Detroit and K-R-I-T; agency. President, F. A. Dutton; treasurer, C. H. Farnsworth; store manager, A. R. Bailey; salesmen, S. M. Harmon, Charles H. Gray.

**J. Walter Emery**, 131 State street; Church-Field electric; agency.

**Fiat Motor Sales Company**, 841 Boylston street; Fiat; factory branch. Manager, R. R. Ross; salesmen, H. E. Marvel, J. W. Burke.

**Ford Motor Company**, 650 Beacon street; Ford; factory branch. Manager, C. E. Fay; salesmen, M. E. Stevens, H. M. Snow, H. S. Mader, C. B. Perham, J. R. C. McBeath, Arthur Combs, C. L. Hildred, I. W. Sibley, J. E. Hooper.

**Franklin Motor Car Company**, 616 Commonwealth avenue; Franklin; agency. President and manager, O. A. Lawton; treasurer, H. D. Cushman; superintendent service station, H. C. Burton; salesmen, P. E. Frost, Benjamin R. Tillson.

**Henderson Motor Company of New England**, 62 Brookline avenue; Henderson; agency. President, J. A. Binney; vice president, E. Burton Chapin; treasurer and manager, Porter B. Chase.

**Hollander Motor Company**, 1112 Boylston street; Cartecar and Cameron; agency. President and manager, G. M. Wetherby; treasurer, S. E. Brown; salesmen, F. Y. Snow, F. W. Paine.

**Henley-Kimball Company**, 893 Boylston street; Hudson; agency. President, A. B. Henley; secretary and treasurer, George B. Kimball; salesmen, H. P. Brigham,

Sherwood Hall, Jr., F. A. Ordway, Lester Rogers.

**Imperial Motor Car Company**, 182 Columbus avenue; Imperial; agency.

**Inter-State Automobile Company**, 618 Commonwealth avenue; Inter-State; factory branch. Manager, V. A. Charles.

**Jackson Automobile Company**, 821 Boylston street; Jackson; factory branch. Manager, J. L. Judd; assistant manager, A. H. Sowers; salesmen, Louis Sackett, B. A. Clark, O. A. Martin, W. G. Tenney.

**Thos. B. Jeffery Company**, 646 Commonwealth avenue; Jeffery; factory branch in process of reorganization into an agency.

**Henry Johnson**, 910 Commonwealth avenue; Morse; agency.

**King Motor Car Company of Detroit**, 1006 Boylston street; King; factory branch. Sales manager, C. S. Moore; W. R. Beattie.

**KisselKar New England Branch**, 940 Commonwealth avenue; KisselKar; factory branch. Manager, H. B. Pruden.

**Knox Automobile Company**, 885 Boylston street; Knox; factory branch. Manager, Frank Crockett; salesmen, Corliss Wadleigh, J. A. Hussian.

**Lawrence & Stanley**, 175 Massachusetts avenue; Mitchell; agency. Proprietors, Herbert M. Lawrence and Richard F. Stanley; salesman, R. G. Smith.

**Lenox Motor Car Company**, Motor Mart; Lenox; sales department. Manager, William Blanchard; salesmen, John Gardner, M. O. White.

**J. M. Linscott Motor Company**, 163 Columbus avenue; Reo; agency. President, George C. Patten; treasurer, J. M. Linscott; salesmen, John H. Taylor, William T. McOwen, William Lally, Roland Smith, Charles A. Clark, John L. Morrissey, Joseph Stagnario.

**Locomobile Company of America**, 700 Commonwealth avenue; Locomobile; factory branch. Manager, E. A. Travis; manager truck department, H. C. Dunn; superintendent service station, C. P. Clark; salesmen, C. A. Kingsley, A. P. Hawes, J. A. Fall, G. A. Hathorn, F. A. Calderwood, F. M. Halligan.

**J. H. MacAlman**, 96 Massachusetts avenue; Stearns-Knight; agency.

**J. W. Maguire Company**, 741-745 Boylston street; Pierce-Arrow; agency. Manager, J. W. Maguire; assistant manager, Elliot Ware; salesmen, Harry Mayo, Roy Hiltz, Allen Huzzy, Kenneth MacLennan, James Marr.

**Marathon Automobile Company of Boston**, 823 Boylston street; Marathon; agency. President, W. Sanford; sales manager, R. G. Houston; salesmen, D. E. Ryan, R. C. MacKinnon, C. Soracio.

**Mercer Automobile Company**, 38 Columbus avenue; Mercer; agency. Fred S. Smith and George L. Osborne.

**Metz Company**, 907 Boylston street; Metz; factory branch. Manager, C. P. Spiegelberg; salesmen, H. G. Burnham, W. O. Jones, F. J. Wetherbee, G. L. Boynton; superintendent of service station, J. M. McGann.

**Alfred Cutler Morse & Co.**, Motor Mart; Renault and S. P. A.; agency.

**Oakland Motor Company**, 100 Massachusetts avenue; Oakland, factory branch. Manager, W. C. Fewell; assistant manager, Harry B. Wood; salesmen, H. C. Wells, Fred Klauer, S. H. Baker, Frank Calburt, Lester Grant, F. J. Riley, G. R. Stearns, P. J. Hupwick.

**Oldsmobile Company of Massachusetts**, 630 Commonwealth avenue; Oldsmobile; factory branch. Manager, L. G. Dodge; sales manager, C. E. Jeffrey, Jr.; superintendent service station, W. J. Jones; salesmen, C. E. Jeffery, Sr., B. H. Rogers, A. R. Hazen, E. A. Sontag.

**Packard Motor Car Company of Boston**, 1089 Commonwealth avenue; Packard; agency. President, Alvan T. Fuller; general manager, Fred C. Graves; sales manager, C. S. Henshaw; manager used car department, A. L. Danforth; manager truck department, A. S. Holly; superintendent service station, I. H. Boles; salesmen, C. A. Robinson, L. R. Mack, W. W. Nichols, J. W. Williams, Jr., C. W. Phinney, J. E. Quimby, Joseph Weeder, Wilbur Keith, H. R. Rasmussen.

**Palge Motor Car Company of New England**, Fenway garage, Ipswich street; Palge; agency. President and general manager, R. B. Nettleton; vice president and sales manager, George A. Crittenden; treasurer, E. G. Cleary; salesmen, Arthur W. Mutty, E. M. Rogers, R. P. Holmes.



# DIRECTORY OF BOSTON AUTOMOBILE DEALERS--Continued.

**Palmer & Singer Motor Company of New England.** 1000 Boylston street; Palmer-Singer; agency. Manager, E. A. McGrath; salesmen, W. E. Burke, C. F. Hurley, C. A. Hurley.

**Peerless Motor Car Company of New England.** 660 Beacon street; Peerless and Rauch & Lang electric; factory branch for Peerless, agency for Rauch & Lang. Manager, J. L. Snow; assistant manager, P. L. McKinney; salesmen, W. S. Jameson, E. Ray Williams, A. V. Shaw, Charles B. Eastman, F. L. Tibbetts, H. J. Sinclair.

**Frank N. Phelps.** 801 Boylston street; Baker electric; agency. Proprietor, Frank N. Phelps; salesmen, F. H. Wentworth, H. W. Burkhardt, F. R. Jefferson, P. B. Smithson.

**Pope-Hartford Company of Boston.** 591 Boylston street; Pope-Hartford and Maxwell; agency. President, George L. Dodd; vice president and manager, F. H. Lucas; secretary and treasurer, C. W. Cousins; salesmen, W. C. Masters, W. S. Howes, F. D. Markee, G. M. Crosby, M. L. Blood.

**Premier Motor Car Company.** 652 Beacon street; Premier; factory branch. Manager, R. I. Eads; salesmen, C. L. Loud, H. D. Bornstein, F. H. P. Lowe.

**R. & L. Company.** 915-921 Boylston street; Garford; New England branch of New York house. Manager, R. F. Ketchum; salesmen, L. C. Bent, Arthur Kerrigan, William Curtis, Roscoe Elwell, Harry Bonley.

**W. L. Russell Company, Motor Mart;** Haynes, Regal and Buffalo electric; agency. President, W. L. Russell; secretary and treasurer, George R. Armstrong; salesmen, H. Hodgdon, E. Phillips, Windsor R. Thomas.

**Stutz Motor Car Company.** 895 Boylston street; Stutz; agency. President, M. F. Chase; sales manager, J. H. Freeman; salesmen, H. D. McIntyre, H. H. Connors.

**Simplex Automobile Agency, Inc.,** 916 Commonwealth

avenue; Simplex; agency. President and manager, H. A. Clapp; secretary, F. O. White; treasurer, Harry McCaffrey; salesmen, L. H. Bradbury, Herbert Rogers, L. F. Hallett.

**W. H. Stevens.** 1020 Boylston street; National and Standard electric; agency. Proprietor, W. H. Stevens; salesmen, H. E. Hart, F. W. Scott.

**D. C. Tiffany Company.** 136 Chestnut street; Ohio electric; agency.

**Wentworth-Fosdick Company.** 926-928 Commonwealth avenue; Hupmobile and Lozier; agency. President, Harry Fosdick; treasurer, Frank Wentworth; sales manager, T. A. Walter.

**White Company.** 930 Commonwealth avenue; White; factory branch. Manager, J. S. Hathaway; assistant manager, Watson Coleman; in charge of agencies throughout New England, C. A. Gilmore; salesmen, Ferdinand F. French, W. A. Stiles, Robert Seymour, Fred White, William Barry, Frank A. Sullivan, Capt. Harry Chase.

**Whitten-Gilmore Company.** 620 Commonwealth avenue; Chalmers and Woods electric; Federal and Standard trucks; agency. President, C. E. Whitten; treasurer, E. A. Gilmore; sales manager, F. P. Allen; superintendent of service station, R. M. Kimball; salesmen, R. B. Jacobs, George Proctor, A. L. Turner, F. S. Sumner, F. D. Brennan.

**F. E. Wing Motor Car Company, Motor Mart;** Marmon; agency.

**Winton Motor Car Company of New England.** 680 Commonwealth avenue; Winton; factory branch. Manager, F. A. Hinchcliffe; office manager, M. F. Roach; superintendent service station, George Hunt; salesmen, W. L. Henegan, W. J. Cronin, Edward Saunders, R. B. Greene.

and they foresee an especially good year.

The automobile industry, although young in years and the result of a rapid growth, is gradually assuming standard business proportions. Not every automobile dealer in Boston is making money. Some, very probably, have not yet been able to appreciate the changed character of the industry as a whole. Several have stated the opinion to the writer within the past week that it takes at least five years to place an agency on a satisfactory business footing. Of course there are many agencies in Boston that are not five years old. It does not follow, necessarily, that these newer concerns are not meeting with success.

## Outlook for the Future.

Boston is the commercial centre for conservative New England. It might almost be characterized as the financial barometer of the country. Five states—Maine, New Hampshire, Vermont, Massachusetts and Rhode Island—and a portion of Connecticut are served by the factory branches and distributors in that city. The men in charge of these have exceptional opportunities for judging of business conditions in this section.

It will be admitted that the month of November is not a particularly auspicious period in which to interview automobile dealers concerning the prospects for the coming year. Experience has indicated that at this time agents are

usually much more actively engaged in closing up affairs for the past season than in laying plans for the future. What the Boston dealers have to say with reference to the outlook for 1914 is of particular interest in consequence. The situation as seen by some of the representative men in the industry in that city is as follows:

### J. L. Snow—Peerless.

Motor car buyers are more careful than ever before, and when they select a high grade car today they expect it to run for a long time. I do not believe this has created an unfavorable condition, but on the contrary it has placed the industry on a strictly business basis. There has been a tendency toward over production and the production of too many types. The result has been a perfectly natural one. I can foresee no lessening of the demand for high grade cars in this territory. Our sales for this year show an appreciable gain over those for 1912, and I see every reason to expect a decidedly better year during 1914.

### F. P. Allen—Chalmers.

It is a question of the survival of the fittest. Manufacturers must learn to study the problem of over production. What you can't have, you always want. In 1910 the public was paying bonuses. Now that it is possible to get a car any time he wants it, the prospective buyer takes more time to look the situation over, and buying is not quite as brisk in consequence. However, the situation, insofar as we are concerned, is giving us no cause for uneasiness.

### C. E. Fay—Ford.

Conditions are exceptionally good with us. The demand in Maine is particularly strong, the people in Aroostook county, for instance, absorbing all the Fords they can get, and our dealers report that the demand for other lines is growing rapidly. The reports from New Hampshire and Vermont are better than ever, and, of course, Massachusetts and Rhode Island are at all times to be relied upon.

### R. I. Eads—Premier.

If money is higher, and I am told it is, it ought to buy more. Insofar as the automobile is concerned it



does. There never was a time when it was possible to secure a better car for \$2000, and in my opinion the medium priced automobile is to be the ultimate car. There is plenty of money in New England, and I have yet to learn of any tendency on the part of its people to deny themselves personal gratification. It would seem to me that there was to be a constant and steady demand.

**Alvan T. Fuller—Packard.**

Business is good—business is always good with Tiffany, John Wanamaker and the Packard car. I could have sold 25 per cent. more cars the last two months had the factory been able to make prompt deliveries. Less political talk and agitation, and more sawing wood will get the result we want. Saw wood. There's plenty of it hereabouts.

**E. A. Travis—Locomobile.**

Our business in Boston for the past year has been just triple what it has ever been before. The prospects are equally as good for the year to come. There is no reason to fear any lessening of the demand for cars. When the American manufacturers have fully supplied the needs of the American people there is plenty of export business to fall back upon. South America offers a market that has never been seriously considered by the American manufacturer, although European concerns seem to find it profitable.

**J. J. McGregor—Cadillac.**

All conditions point to the best business ever. We have delivered more of next year's models to date than in any previous year at this time, and we have more orders on file for future delivery. There is a particularly fine demand for enclosed cars this season. This applies to the metropolitan district of Boston.

**F. A. Hinchliffe—Winton.**

Our business is right up to last year's record, and that was the best we have ever had. I have every reason to believe we will sell the same amount next year. I mean just that. The industry will see a general readjustment, which will be the best thing for all concerned. There is going to be good business for any manufacturer or dealer who does business in a proper business way.

**J. S. Hathaway—White.**

We have more orders on the books for spring delivery than we had a year ago. Our deliveries to date are about on a par with those for 1912. I think we are going to do an even better business next year.

**H. A. Clapp—Simplex.**

There is always a demand for a good, high grade car. There are certain people who will buy them anyway. We expect a good year's business. Some manufacturers have not been as conservative as they should have been, and it would have been better for the industry if they had started in a small way and built up a business gradually. But, in the main, the outlook for 1914 is bright.

**A. H. Sowers—Jackson.**

The outlook is good—remarkably so. Agents throughout Massachusetts and Vermont report that things are looking splendid. The demand is going to be for medium priced cars in the future.

**R. G. Houston—Marathon.**

We are practically a new concern in this territory, but the outlook is very good. We are getting our share of the business, and I see no reason why we should not continue to get it throughout the coming year. Cars are selling at a price where people can afford to buy, and many people are buying who have not thought they could own a car before.

**Frank Crockett—Knox.**

There is a big field for the medium priced, six-cylinder car, and there are a great many users of high grade automobiles—the class of people who ride in Pullman trains. In the future, changes will not be so many or so marked, although there always will be improvements. There is every indication that the industry is being put on a strictly business basis.

**J. S. Donovan—Studebaker.**

The public is going to buy cars if nothing else. All factories are taking care not to have an over production, and good cars will be as scarce next spring as ever. There never will be as many cars made in one season as were made during 1913, but that does not mean poor business. The whole industry is getting down to a legitimate business basis.

**A. B. Henley—Hudson.**

It will be our best year. We are now way ahead of last year's business at this time, and we are selling cars every day. In the future there will be three classes of cars. Dealers in high priced machines will be able to sell

all they can get. There will be an ever increasing demand for medium priced and low priced models. Perhaps we will have to add a fourth class—those which shall be termed very low priced.

**M. F. Chase—Stutz.**

Men are getting motor wise, and the manufacturer must give them what they want. We will do more business next year than last. Already we have received nearly five times as many orders for cars as at the same time in 1912.

**C. B. Spiegelberg—Metz.**

Conditions are looking very good. We are going to sell a lot of cars next year. I don't know anything about the other lines, but I do know that a lot of people have heard about this line this year, and lots of folks want them.

**G. M. Wetherby—Cartercar.**

I understand that every farmer in Maine either owns a car or is going to buy one. I know that we are doing a big business among the country people. I think you will see less factory branches in the future and agents will be better able to conduct business in competition with each other.

**J. L. McKone—Overland.**

Business with us never looked better. You had to be a sport to sell as well as own a car 10 or 15 years ago, but that day has gone by. The manufacturer or agent who does business today must do it on a business basis, and I find that a great deal of the selling is done by the owner.

**J. W. Bowman—Stevens-Duryea.**

You can eat just as much porridge out of a dish purchased in the 10-cent store as from the best piece of Haviland china made. Selling automobiles is just like selling anything else. There always will be a demand for a high grade article, whether it be a car or a shirt. People have confidence in the man who makes and the man who sells, and they are always going to have. We sell more of this make of cars than any other agency in the country and we expect to be able to say the same thing a year from now.

**J. H. MacAlman—Stearns-Knight.**

This is going to be our best year. The situation is no different now than it ever has been. There always have been men in the manufacturing end who thought that when they sold a car they could spend the money without considering the overhead. Profit is not always what it seems on the face. There always will be a demand for high grade cars and there is no reason for suggesting that there is anything wrong with the automobile industry.

**W. C. Sills—Chevrolet.**

I look for a shortage of cars next season in February or March. We are already about 100 behind on deliveries throughout New England. The big demand in the future will be for medium priced cars.

**William Blanchard—Lenox.**

Conditions look good. People know what they want and don't mind paying the money for a good car. The day of big output is over, and the industry will be on a better paying basis in consequence.

**W. L. Russell—Haynes.**

It is a good time to put in a lot of hard work, and the sales will take care of themselves. The tendency is toward the car of medium price on the part of the man who used to pay more. The demand below \$2000 is good, going right down the line.

**George E. Curtin—Speedwell.**

We expect good business, judging from the number of inquiries we have had concerning the new rotary valve motor. I would say that the demand is for cars of medium price. Many men who formerly felt it was necessary to purchase a high priced machine have come to learn that good cars are produced for less money.

**J. M. Linscott—Reo.**

The demand is for low priced cars. We are about 100 behind on our orders and my partner is in Lansing, Mich., trying to get the machines. We see no cause for complaint, except on that score.

**J. W. Maguire—Pierce-Arrow.**

The situation looks good to us. We find that the man who can afford to pay \$3000 will pay the long price and get the best.

**R. R. Ross—Flat.**

We are looking forward to a big year. Our growth has been steady and healthy each season. High grade cars always will be sold and we feel that we shall get our share of the business.



## BOSTON'S ELECTRIC AUTOMOBILE SALON.

**C**ONFIDENCE is a basic principle upon which all successful business is conducted. The people of Boston and New England, while comprising perhaps the most conservative element in this country, have supreme confidence in the automobile dealers in that territory. Thus is explained the fact that Boston may attempt innovations with every assurance that the result will be equal to anticipations.



**Day Baker, General Director Electric Automobile Salon.**

which came to a successful conclusion in the ballroom of the Copley Plaza hotel, Boston, Nov. 19, was a distinct innovation. Nothing like it ever had been attempted before anywhere in the world. It was a social success in that it became one of the important events of the season on the social calendar. The commercial side was kept well in the background, but the statement is made, unofficially, that something like \$40,000 worth of business was secured during the three days of the display. It is understood that the Electric Motor Car Club of Boston, under whose auspices the show was held, has engaged the Copley Plaza ballroom and all of the adjoining rooms for a similar exhibit next year, during the month of November.

It must not be understood that this result was attained upon the spur of the moment, although it is true that less than two weeks elapsed between the final decision to hold the display and the actual opening of the doors. The electric pleasure automobile has had its adherents in Boston and vicinity for many years. In fact, experimentation in electric vehicles was quite as prominent in this field in the earlier days of the industry's history as anywhere else in this country. However, it is not denied that the use of such

cars has been somewhat larger in some other sections. This has been due to a number of causes, but it rapidly is being made evident that there are at present no reasons which cannot be overcome by careful presentation of the facts.

Soon after the organization of the Electric Motor Car Club of Boston in April, 1911, there was begun an active campaign to secure a more general application of the electric machine both for business and pleasure. Reference might be had in this connection to both freight and passenger vehicles, but the statement should be made to apply in this instance to the latter type. It is conceded that the electric passenger automobile is quite as well adapted to business purposes as to social uses.

Within the past year the number of electrics of this type in service in Boston and its immediate vicinity has increased some 42 per cent. This, in itself, is sufficient indication of their increasing popularity, and explains, in a large measure, the success enjoyed by this first Electric Automobile Salon. It also suggests the wisdom of the dealers in deciding upon an innovation of this character.

The decorations were strictly in keeping with the simplicity of the vehicles displayed. The treatment of the ballroom by its designers is such as to leave little to be desired in this respect. The appointments of the cars themselves are quite sufficient to set off their beauty without additional adornment. It seemed to the committee in charge of this feature that the simplest arrangement would prove most effective, and the special decorations consisted solely in the artistic placing of large bouquets of yellow chrysanthemums at various points about the hall. The



**W. H. Blood, Jr., Who Formally Opened the Salon.**



color selected was a particularly appropriate one, inasmuch as it blended well with the electric lighting of the building and of the cars.

Because of the historical importance of the event it was deemed consistent to depart somewhat from the conventional, and the opening of the salon was rather more formal than is usual with automobile shows in this country. Abroad, it always has been the custom to ask men of prominence to strike a keynote of the exhibition in the presentation of opening addresses. This plan was followed in this instance. The speakers were Day Baker, president of the Electric Motor Car Club of Boston, and William H. Blood, Jr., first president of the Electric Vehicle Association of America.

Mr. Baker spoke in part as follows:

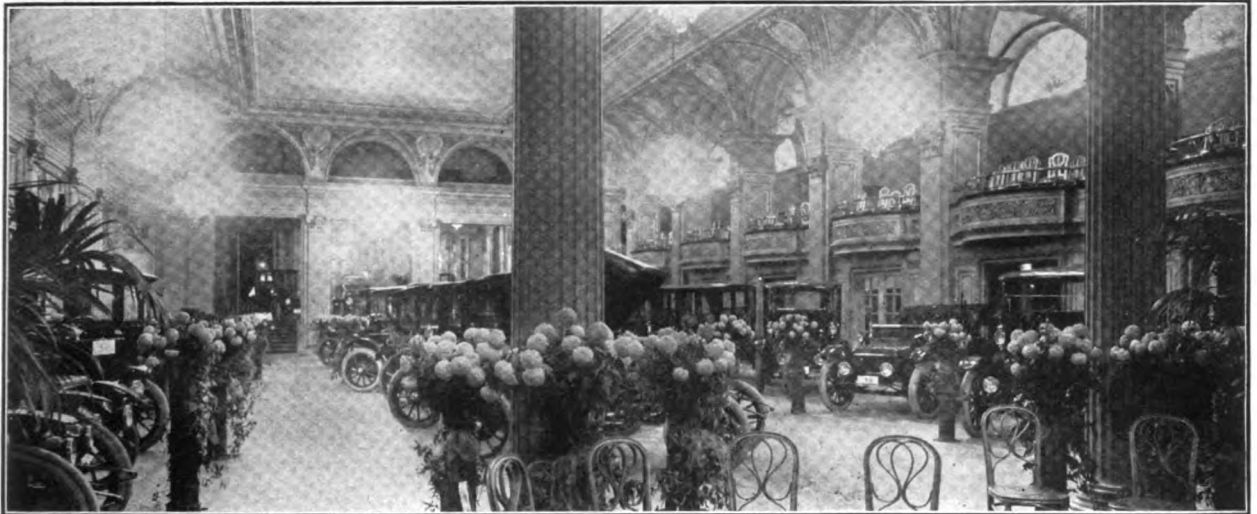
It is with great pleasure that as president of the Electric Motor Car Club of Boston, I welcome you here

the first president of the national association, and it gives me great pleasure to introduce to you this evening the first president of that association, W. H. Blood, Jr., who will now formally open this salon.

The following is an abstract from Mr. Blood's address:

I fully appreciate the honor, which has been thrust upon me, of making the official announcement of the opening of "Le Salon de l'Automobile Electrique". In France, the president of the Republic opens "Le Salon de l'Automobile", while in this country you have selected the humble ex-president of the Electric Vehicle Association of America. I am greatly honored to be put in a class with M. Poincare.

The first Electric Automobile Salon to be held in the United States, and, so far as I am able to determine, in the world, is now open. The Electric Motor Car Club of Boston, under whose auspices this salon will be given, is to be congratulated upon this achievement. The electric vehicle fraternity presents to the public the last word in motor car design and the public embraces this unusual opportunity of seeing, under one roof, the comparative merits of all that is best in electric motor cars. The electric automobile, through this salon at the Copley Plaza, has, like many another "debutante", made its initial bow and is now being received into Boston so-



General View of the Copley Plaza Ballroom During the Progress of the World's First Electric Automobile Salon.

this evening to view the first Electric Automobile Salon of this country. This evening marks an epoch in the advance of the electric vehicle. It is one of the milestones to which we will look back in years to come as one of the important events in the electric passenger automobile industry in the United States.

Ex-President Taft recently remarked that whenever it was necessary to find anything new, you should come to Boston. With this in mind, I would like to call your attention to the fact that only a few short years ago, in one of the offices of a battery company on State street, the idea of an Electric Vehicle & Central Station Association was conceived, and in March, 1909, a number of electric vehicle enthusiasts and central station men met at the Hotel Tuilleries and inaugurated a small organization, which has since grown to mammoth proportions, until the combined capital of the companies interested in this Electric Vehicle Association of America is now well over \$600,000,000.

The Electric Automobile Salon has long been the dream of a few members of the Electric Motor Car Club of Boston, and tonight we see realized, in a beautiful manner, in this exquisite room, our vision, which we so fondly treasured.

Not only was the idea of the Electric Vehicle Association born in Boston, but from Boston was elected

ciety. This is the coming-out party of the electric pleasure car.

It was just about 20 years ago that the first electric vehicles appeared in Boston, but they were of little value from a practical standpoint; they were hardly more than experimental forerunners of what was to come. The underlying principles employed were correct, but the way that those fundamental ideas were worked out was crude. The designs were clumsy, the motors inefficient, and the batteries were unnecessarily heavy. A few venturesome individuals purchased these experiments, only to be rewarded by high cost of upkeep and unsatisfactory operation. Even these early cars ran. Electrics always run. This is one of the salient features of the electric automobile—it runs.

For a number of years the electric vehicle has been going through a period of development and of improvement, and it now appears before the public as a perfected article. It possesses at least three points of superiority which must appeal to everyone—simplicity, beauty, durability.

**Simplicity**—You press a button, or move a handle, and off you go. There is no cranking, no spark adjustment, no shifting of gears or adjustment of carburetor—a single motion and the car is under way. A child can operate it and many a woman who knows nothing of me-



chanics finds pleasure in going and coming in her own car, when and as she pleases. The modern electric car is simplicity itself; it has very few parts and these are usually understood and adjustments are quickly made.

**Beauty**—I need say but little on this score, for I am sure that you have already noticed the artistic lines of the cars on exhibition. The coach builder's art has reached its climax in the design and construction of the modern electric coupe. The appointments and the upholstery are rich, yet simple, and even the most fastidious critics are satisfied with the beautiful creations which are on exhibition in this room tonight. The most exquisitely gowned and gloved lady is as much in keeping with her surroundings in one of these palatial cars as in the glittering ballroom. The modern electric is properly named the "car de luxe".

**Durability**—It is a common saying in the South that "No one ever saw a dead mule". In the North we say: "No one ever saw a worn out electric car". Styles may change from year to year, but cars that were made 10 years ago are still to be found in daily service, giving satisfactory results. Electric motors are practically indestructible. The storage battery of today lasts twice as long as those of a few years ago.

The electric automobile is fast coming into its own; its popularity is increasing from day to day. We are a little slow here in the East in adopting it, but during the past two years the increases have been remarkable. While in Chicago a few months ago, on returning from the theatre to my hotel, I was interested to count the automobiles in waiting. There were 107, counting all kinds. Of these, 81 were electric—a very creditable proportion. Chicago now boasts of a total of nearly 3000 electrically propelled vehicles. In Washington one hardly sees anything else in the shopping district. Even Kansas City, with its steep hills, boasts of many, and the women of that city enjoy to the utmost the independence which their electric gives them. During the past 12 months the number of electric in Boston has increased 42 per cent., yet as far as the total number in use is concerned, Boston is a long way from the top of the list.

The electric pleasure car is not a competitor of the gas car. It rather supplements it. As a town car the electric is the car "par excellence". For calling, for shopping, for the theatre and the club, the electric car cannot be equalled. This salon is for you to become acquainted with the electric pleasure car and to convince you that you cannot do without it. The low cost of operation will surprise you. The cost of electric current, due to the far-sightedness of the Edison Electric Illuminating Company of Boston, has been periodically reduced to a minimum and in this respect shows a sharp contrast to the ever increasing price of gasoline. Other costs, due to operating at comparatively low speeds, and complete emancipation from the chauffeur, are a satisfactory surprise to those who have operated other cars.

The salon is for the public to become acquainted with the facts to which I have referred and many others which I have not mentioned. The "Salon de l'Automobile" of Paris was discontinued for a few years and the entire French automobile industry suffered in consequence. It has been revived again with most satisfactory results to both the manufacturers and the public. I feel sure that this "Salon de l'Automobile Electrique de Boston" will prove to be both of pleasure to the public and of profit to the exhibitors. As an institution I believe that it has come to stay. The manufacturers have in it an unusual opportunity to meet face to face the appreciative members of Boston's society, who have abundant means with which to purchase the most up-to-date transportation machines. The purchasers likewise may take advantage of the facilities offered by means of this salon to select from the many beautiful models the car which appeals to them as "a thing of beauty". In the full assurance that it will prove to be "a joy forever".

"Vive le salon de l'automobile electrique de Boston".

The list of exhibitors and the models shown by each follow:

**S. R. Bailey & Co.**, 895 Boylston street; Bailey. Two-passenger roadster, four-passenger roadster or touring car and victoria phaeton.

**Frank N. Phelps**, 801 Boylston street; Baker. Five-passenger brougham, two-passenger roadster and two four-passenger coupes. With the exception of the road-

ster the bodies were with special upholstery designs by Paul Polret.

**W. L. Russell Company**, Motor Mart, Buffalo-Babcock. Roadster and two coupes.

**Anderson Electric Car Company**, 903 Boylston street; Detroit. Two four-passenger broughams, five-passenger brougham and roadster.

**D. C. Tiffany Company**, 136 Chestnut street; Ohio. Four-passenger brougham and five-passenger straight line brougham.

**Peerless Motor Car Company**, J. L. Snow, 660 Beacon street; Rauch & Lang. Five-passenger brougham, seven-passenger town car (five inside and two outside), three or four-passenger demi-brougham and roadster.

**W. H. Stevens**, 1020 Boylston street; Standard. Four-passenger coupe.

**J. W. Bowman Company**, 91 Massachusetts avenue; Waverley. Victoria, Colonial brougham, four-passenger limousine, five-passenger limousine and roadster.

**Whitten-Gilmore Company**, 620 Commonwealth avenue; Woods. Three-passenger roadster, five-passenger extension brougham and four-passenger pony limousine.

The accessory department, if such it may be termed, was limited to the appearance of four makes of storage batteries, these being displayed as follows: Herbert S. Potter Company, 24 Commerce street, Edison; Electric Storage Battery Company, 60 State street, Exide; American Storage Battery Company, Albion street, Cambridge, Harvard, and Philadelphia Storage Battery Company, Ferdinand and Piedmont streets, Philadelphia.

The attendance throughout the three days was uniformly satisfactory. Regarded in many ways as a society event, people of social prominence lent the salon every approval, and the handsome gowns of the women, with the dignified electric equipages for a background, made a picture that will long be remembered.

Particular mention should be made of the musical programme, and in this respect the Electric Automobile Salon was again somewhat distinctive. The music was of the highest character, and of such quality as easily to permit conversation by the members of the reception committee and their guests. One of the features of the closing evening was the extinguishing of all the electric lights of the building and the illumination of the ballroom by means of the lights on the cars exclusively.

It is impossible to give personal credit to all who co-operated so admirably in making this initial Electric Automobile Salon a splendid success. The remarkably smooth and artistic working out of the details was due largely to the executive ability of President Day Baker, who acted as general director. He was ably assisted in their respective fields by Albert Weatherby, chairman of the executive committee; Herbert Moses, supervisor of committees; Charles H. Hatch, chairman of the reception committee; W. H. Atkins and F. S. Mansfield of the Boston Edison Company, and O. G. Draper, business secretary of the Electric Motor Car Club of Boston.



## PROVIDENCE SHOW IN JAPANESE GARDEN.

PAST achievements offer the best inducement to strive for still more marked success. Percival S. Clark, chairman of the show committee of the Rhode Island Automobile Dealers' Association, Providence, R. I., had before him the example set by two previous motor car exhibitions, in which every effort was expended to make the display one to be long remembered for its beauty and completeness. With the help of the other members of his committee, he has set a new standard for local shows in New England.

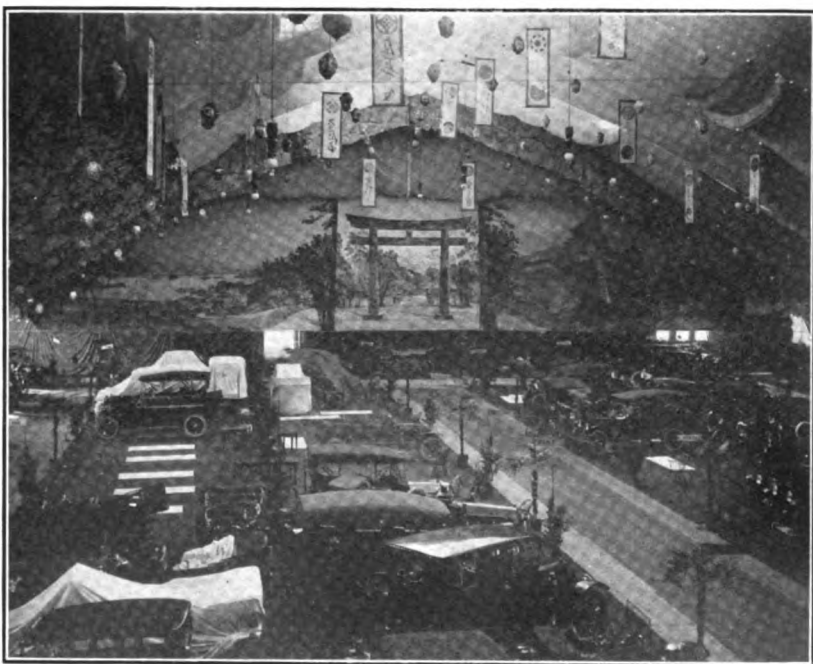
Thousands of people from Rhode Island and the neighboring sections of Massachusetts and Connecticut visited the state armory in Providence, the evening of Nov. 22, to witness the opening of the third annual automobile show of this association, which will continue until Nov. 29. Upon entering the building the attention was first drawn to the artistic decorative treatment. An immense painting, representing a garden scene in Japan, with Mount Fujiyama's snow capped peak in the background, was suspended at the rear of the building. This had the apparent effect of increasing the size of the main hall, where the pleasure vehicles were displayed, although it is one of the largest exhibition floors in New England. The entire treatment of this floor was in keeping with the central piece, and the judicious use of Japanese lanterns and banners created the impression of displaying the cars in the garden itself, amid its realistic surroundings.

But attention was drawn from the cars only for the moment. Along the side walls and in the centre of the main hall the latest models were arranged so as to permit of ready inspection, and in most instances the machines on display were direct from the factory, some of them arriving in Providence but a few hours before the doors were opened. A feature of the pleasure car section was the prominence given to electric machines, and the interest in them was sufficient indication of the importance in which they may be regarded in this field in the future.

Another feature of particular interest was the

Imp cyclecar. This was the first time that the people of New England have had opportunity to inspect these little machines. In fact, the Boston agency for this make has had a model in its show-rooms but a comparatively short time. During the opening night at the Providence show the space occupied by the Imp was crowded all of the time, and the attendants were kept exceedingly busy answering questions.

Trucks, motorcycles and accessories were exhibited in the basement, as in past years, but, as was true of the pleasure vehicle section, the number of individual displays was much larger than



1914 Models in Japanese Setting at Rhode Island Automobile Show.

heretofore. One of the anterooms near the entrance to the building was utilized for an overflow, both of cars and accessories.

The list of exhibitors and the product displayed by each follows:

**Pleasure Cars**—Adams & Knight, Mercer, Apperson; Aetna Bottle & Stopper Company, Buick; Charles Barre Company, Lehigh; Herbert E. Bradford, Pilot; Cadillac Automobile Company of Rhode Island, Cadillac; Capitol Motor Car Company, Hupmobile; Percival S. Clark, Oakland, Jeffery, Mitchell; Davis Automobile Company, Chalmers, Locomobile, Regal, Winton; Elmwood Motor Car Company, Imperial, Standard electric; Flat Motor Sales Company, Flat; Foss-Hughes Company, Pierce-Arrow; William H. Fuller, Cole; Goodwin-Sherman Motor Car Company, Studebaker; Hitchcock-Banks Motor Car Company, Knox; Williams Hughes Company, Reo; Kendall garage, Stutz; King Motor Car Company, King; Lister, Smith & Walsh Company, Paige, Jackson; L. B. Lorimer,



Hudson; J. E. Newton, Stevens-Duryea, Detroit electric; Nock Automobile Company, Kissel-Kar; North End garage, Case; John O'Donnell, Premier; Packard Motor Car Company, Packard; Peerless Motor Car Company, Peerless; Pope-Hartford Automobile Company, Pope-Hartford; Providence Motor Car Company, Velle, Maxwell; Pugh Bros Company, Overland, Marlon, American; C. K. Setchell, McIntyre, Imp cyclecar; E. A. Sontag, Oldsmobile; Speedwell Company, Speedwell; E. E. Whipple, Chevrolet, Detrolter; White Automobile Company, White; Whitten Motor Vehicle Company, Abbott-Detroit, Marathon, K-R-I-T; Wallace L. Wilcox, Franklin.

**Commercial Cars**—Aetna Bottle & Stopper Company, Bulck Autocar Sales & Service Company, Autocar; H. E. Bradford, Selden; Capitol Motor Car Company, Koehler; Percival S. Clark, Jeffery; Foss-Hughes Company, Pierce-Arrow; Hitchcock-Banks Motor Car Company, Knox-Martin tractor; B. F. & A. W. Hopkins, I. H. C.; R. S. Longley, Kelly; Nock Automobile Company, Commerce; Packard Motor Car Company, Packard; Peerless Motor Car Company, Peerless; Pope-Hartford Automobile Company, Pope-Hartford, Stewart; Pugh Bros. Company, Federal, Willys Utility; Stanley Motor Carriage Com-

pany, Stanley steam; U. S. Mill Supply Company, Mais, Brown; White Automobile Company, White.

**Motorcycles**—Hirah G. Baxter, Excelsior, Henderson; Elmwood Cyclery, Harley-Davidson; Marceau Bros., Yale; B. A. Swenson, Indian.

**Accessories**—Waite Auto Supply Company, Waite Success batteries, Four-in-One auto heater, Warner speedometer, Vacuum Mobiloil lubricants, Arnold Hough whistles, Thermite, Weed chains, Empire and Seamless tires and a full line of other goods; Belcher & Loomis Hardware Company, United States, Federal, Firestone, Goodyear and Goodrich tires; A. C. C. Oil Company, Acco lubricants; Russell Manufacturing Company, brake lining; Fryer-Auster Company, tonneau windshield; Winsor Manufacturing Company, Winsor valve remover; Ernst Flentje, shock absorber; Auburn Wheel & Manufacturing Company, E-Z Ford rim, wheels and bodies; Providence Auto Equipment Company, Hood tires, etc.; William D. Goff, insurance; Wayne Oil Tank & Pump Company, gasoline and oil storage systems; Aetna Life Insurance Company, insurance; Providence Petroleum Products Company, oils, greases, etc.; Cherry & Webb, wearing apparel for automobilists.

## ATLANTA'S "MILLION DOLLAR" DISPLAY.

THE importance of the Southland as a market for motor vehicles was never better demonstrated than during the progress of the



R. N. Reed, Chairman Atlanta Show Committee.

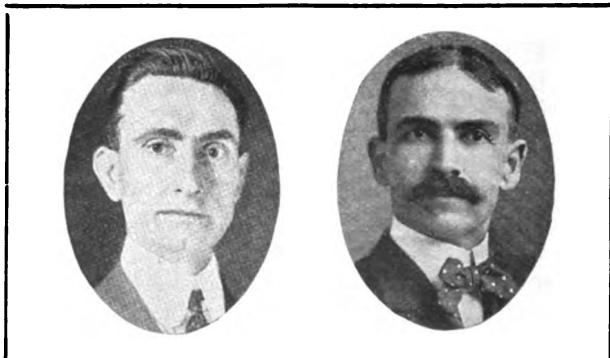
third Great Southern automobile show in the Auditorium-Armory, Atlanta, Ga., Nov. 8-15. The exhibition was heralded throughout the states below the Mason-Dixon line as a "Million Dollar" display, the inference being that cars valued at that sum were to be on view during the week. This portion of the programme was fully realized

and there is much reason for suggesting that the term might have been made to apply to the amount of business resulting from the display. Certain it is that the crowds in attendance and the interest taken in the various new models shown were such as to justify the assumption that 1914 is to see a splendid year's business in the district of which Atlanta is the commercial and social metropolis.

For a number of years—ever since the national automobile display in Atlanta in November, 1909—the demand for cars in the South has been increasing. Good roads agitation has played its part in bringing the advantages of the motor vehicle to the attention of the public. In 1911 the Atlanta dealers decided to stimulate business activity by holding a local show, and

their efforts were crowned with such success that the Atlanta Automobile & Accessory Association was formed to take charge of the annual display in November. Last year the show was such a business producer that the association determined to eclipse all previous records in the "Million Dollar" exhibition just closed.

The committee in charge of the arrangements was composed of R. N. Reed as chairman, George W. Hanson, K. T. McKinstry, C. H. Johnson, J. K. Gewinner, H. D. McCutcheon and John F. Poole. All interests were represented in the personnel and each worked in harmony with all the others to make the event a splendid success. Taking advantage of the climatic conditions, it was deemed wise to adopt measures not hitherto tried in the holding of shows of this character. Atlanta business men were encouraged to enter into the spirit of the occasion, and the entire week was



George W. Hanson, President, and C. H. Johnson, Vice President of the Atlanta Automobile & Accessory Association.

given over to the exploitation of the automobile and to calling attention to Atlanta as a commercial centre.





Members of Atlanta Show Committee: Left to Right, J. K. Gewinner, H. D. McCutcheon, K. C. McKinstry, J. F. Toole.

One of these extraneous features, if such it may be termed, was a floral parade, Tuesday morning, for which fully 2000 cars lined up on either side of Whitehall and Peachtree streets. There was a long list of prizes. Mrs. P. T. Heath, driving a Studebaker covered with 7000 pink and white roses, won the first award for the most beautifully decorated machine, while second place went to Mrs. George Hanson, with an Oakland hidden by yellow and white chrysanthemums over which a flight of milk white doves was suspended. The car winning the prize for originality was driven by Lon J. Daniels. It was decorated with autumn leaves, and at the front a bevy of partridges peeped out from the crimson foliage.

Inside the hall the treatment was simple, the committee deciding upon the use of bunting and flowers in such manner as not to detract from the beauty of the cars on display. The plan was one which was calculated to confine the commercial features of the show to the interior of the Auditorium-Armory, although business was by no means the only attraction even there. Sousa's famous band furnished the musical programme, and many of the younger set found opportunity for dancing in the aisles. This was particularly true Thursday evening—Society night.

The show was made more notable by the formal presentation of the Lyons-Knight pleasure car, made in Indianapolis, to the people of the South, and by the first appearance of the Imp cyclecar in that section. Both

attracted unusual attention throughout the week. The department devoted to commercial vehicles was of particular interest to business men, and in this the Van Winkle truck, an Atlanta product, was a feature. The exhibitors were:

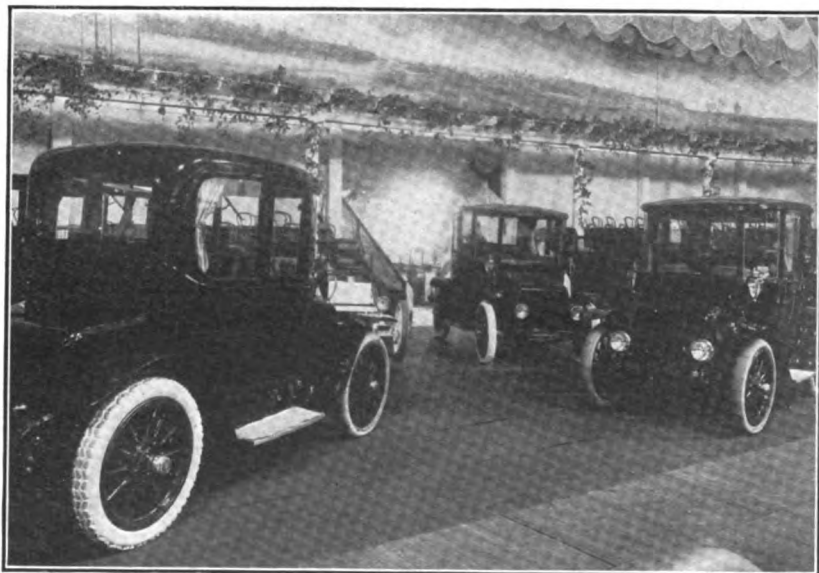
**Pleasure Cars**—Mitchell Motor Company of Atlanta, Mitchell; Velle Motor Vehicle Company,

Velle; Oakland Motor Sales Company, Oakland; Johnson Motor Car Company, Stevens-Duryea, Chevrolet, Lyons-Knight; Buick Motor Company, Buick; Cartercar Company, Cartercar; Overland-Southern Automobile Company, Overland; Standard Auto Company, Paige; John M. Smith, Pierce-Arrow, Chalmers, Hupmobile; Cole Motor Company of Georgia, Cole; Locomobile Company of America, Locomobile; Steinhauer & Wight, Cadillac; Fulton Auto Supply Company, Hudson; Premier Sales Company, Premier, Herreshoff, Baker electric; Burns & Houser, Oldsmobile, Regal; Maxwell Motor Sales Company, Maxwell; Atlanta Auto Sales Company, Henderson; J. I. Case Threshing Machine Company, Case; Ford Motor Company, Ford; K. T. McKinstry, Ohio electric; Carl W. Fort & Co., Marmon, King; Smith & Love, K-R-I-T; Imp Cyclecar Company, Imp cyclecar.

**Commercial Vehicles**—International Harvester Company of America, I. H. C.; Johnson Motor Car Company, Chase; Buick Motor Company, Buick; Overland-Southern Automobile Company, Willys Utility; Standard Auto Company, Selden; Van Winkle Motor Truck Company, Van Winkle; Stewart Motor Truck Sales Company, Stewart; Velle Motor Vehicle Company, Velle.

**Motorcycles**—Hendee Manufacturing Company, Indian; Harley-Davidson Motor Company, Harley-Davidson.

**Accessories**—Chas. E. Miller, full line; Atlanta Top & Trimming Company, tops; Wayne Oil Tank & Pump Company, storage systems; Reed Oil Company, oils and greases; Johnson-Gewinner Company, general line.



Partial View of the Atlanta Automobile Show, with the Ohio Electric in the Foreground.



### BUYS ABBOTT COMPANY.

#### Pittsburg Concern Takes Over Business of Well Known Detroit Company.

Announcement is made from Detroit that the Edward F. Gerber Company, Pittsburg, Penn., has purchased outright the plant and business of the Abbott Motor Company of the former city, the sale having been ratified by about 90 per cent. of the stockholders. The name of the latter concern will not be changed, and the production of Abbott-Detroit cars will be continued under the new management, with the same factory organization and managing officials.

The Gerber company has been somewhat well known in the industry as a distributor in western Pennsylvania, and at one time made an offer to take over the production of Michigan cars, soon after the recent failure of the Michigan Motor Car Company in Kalamazoo, Mich. With its acquisition of the Abbott-Detroit business, sufficient working capital is promised to produce cars on a large scale.

### EISEMANN MAGNETO REMOVES.

#### Sales and General Offices Now Located with Factory in Bush Terminal.

Announcement is made by the Eisemann Magneto Company that its sales and general offices have been removed from 225-227 West 57th street, New York City, to the same building in which the factory is located, Bush Terminal building No. 8, 32 33rd street, Brooklyn, N. Y. The change was made because it was felt that it was more advantageous to have these offices in closer relation with the factory, and the fact that the old location was largely outgrown had its full weight in influencing the decision.

It is added that the company will maintain a service station at the West 57th street address, where the many users of Eisemann magnetos throughout that district will be able to receive the same courteous treatment that has been accorded in the past.

### AN INTERESTING BOOKLET.

#### Electric Vehicle Association of America Publishing Novel Treatise.

"The Story of the Electric Pleasure Vehicle" is the title of an interesting and attractive booklet just issued by the Electric Vehicle Association

of America, with headquarters at 124 West 42nd street, New York City. The text matter treats of the early history of this type of automobile, supplemented by descriptions of the latest models of electric pleasure cars. The booklet is fully illustrated with views of ancient and modern machines, and the typographical work is particularly attractive.

The booklets have been prepared for general distribution in an educational campaign recently inaugurated by this organization, in which makers of electric pleasure cars and accessories and equipment therefor are interested. Copies may be secured by making request of the association at the above address.

### MILLER'S ADVANCE CATALOGUE.

#### Pioneer Accessory House to Distribute 100,000 Copies at the Shows.

Chas. E. Miller, 97-103 Reade street, New York City, is issuing the 1914 advance catalogue No. 27. Special reference should be made to the cover treatment, which is quite in keeping with the varied lines handled by this pioneer accessory house. Automobiles, motorcycles, aeroplanes and motor boats are worked into the design in a particularly pleasing manner.

The catalogue contains a number of new lines recently added by this well known manufacturer, jobber, exporter and importer, and 100,000 copies have been prepared for distribution at the various automobile shows throughout the country. Beside the headquarters at the above address, branch stores are maintained in the following cities: New York, Brooklyn, Buffalo and Albany, N. Y.; Boston and Springfield, Mass.; Hartford, Conn.; Detroit, Mich.; Cleveland, O.; Philadelphia, Penn.; Atlanta, Ga.; New Orleans, La., and Newark, N. J. In addition, the parcel post policy of the concern is such that every motorist is able to purchase direct from any of these branches with immediate delivery at the home address anywhere in the United States.

E. G. Bennet, vice president of the General Motors Export Company, who has charge of the foreign business for the Oakland car, made by the Oakland Motor Car Company, Pontiac, Mich., reports that shipments of this make of machine are being made to a large number of foreign countries. Recently Oaklands were shipped to China, Java and Australia. Mr. Bennet leaves shortly on a business trip to Russia, going to Vladivostok, by way of St. Petersburg.



# ELECTRIC LIGHTING AND MOTOR STARTING.

## Practicability of Equipping the Used Car Demonstrated by Installation of Various Systems on Standard Models—Factors Considered in Selecting Dynamo, Etc.

(By C. P. Shattuck.)

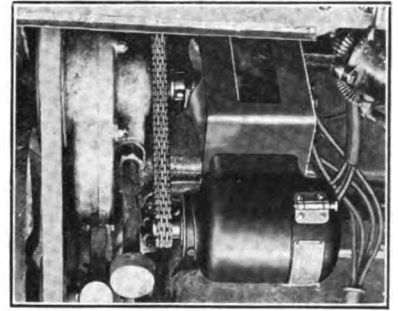
OF THE equipment added to the motor car by the maker none has created more interest among the owners of used automobiles than the electric lighting and motor starting systems. That their convenience appeals to the motorist is demonstrated by the large number of inquiries received by The Automobile Journal from its readers as to the practicability of installing a lighting dynamo and a motor starter.

In order to compile authentic information the writer invited each manufacturer to present his views upon the subject, and in a majority of instances the data were supplemented with sketches showing installations on used machines of standard makes. Lack of space prevents utilizing all of the plans submitted, but a sufficient number

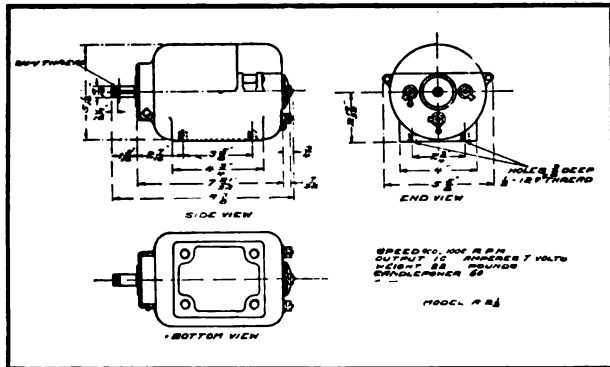
and motor starting was adopted by practically every manufacturer, or made optional with the purchaser, have been equipped and at a moderate cost, because the owners made a thorough examination of every system and selected one that could be fitted to give practical results and at a reasonable expense.

Every owner desiring to equip his machine with electric lighting or motor starting should investigate every system, selecting that which is best suited to the design of car, if he would obtain satisfactory results, for the most perfect equipment will lack efficiency if improperly installed. The large number of systems fitted to standard makes of cars should be sufficient guarantee as to their practicability and efficiency, and with the data issued by the manufacturer one should be able to select and install an equipment which will obtain the desired results without an excessive expenditure of money.

On the other hand, if one favors a particular equipment without reference to its adaptability to the car, the price and expense of installation will doubtless be prohibitive. This contention is borne out by the statement of a prominent manufacturer, who says that when the majority of owners seeking information as to the cost of his



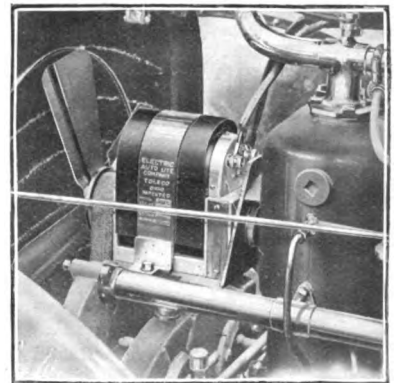
Aplico Dynamo Installed on the White Car.



Dimensions of Aplico Model A 2 1/2 Generator and Data as to Drive, Output, Etc.

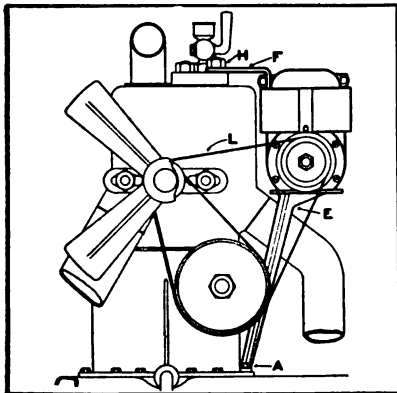
is presented to demonstrate the practicability of equipping the used motor vehicle with lighting dynamos and motor starters.

Many owners of popular and moderately priced machines desiring electrical equipment have vague ideas as to its construction and operation; the steps necessary to install it and the cost of the completed work. Several cases have come to the attention of the writer where motorists decided upon a certain type of dynamo or motor starter without investigating its adaptability to their cars and, upon being advised by the manufacturer as to the probable cost of installation, decided to retain the oil and gas lighting systems. On the other hand, many cars made previous to 1913, at which date electric lighting



Method of Mounting the Electric Auto-Lite.



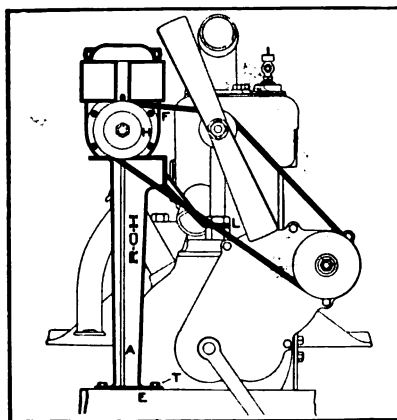


Fisher Generator on Hupmobile.

equipments for the used car, but in most every instance the design of the machine was such as to present no great difficulty in installing and the cost was reasonable.

Instances are recorded where the maker has advised the prospective purchaser that lighting and motor starting is a manufacturer's proposition. In explanation of the statement it may be said that there are certain models of cars which would require considerable alteration and mechanical ingenuity to install the equipment so as to give satisfactory service, and it is obvious that under these conditions the amount involved would not warrant the expenditure. Then again, a unit system, a motor and a generator combined, which is favored by some makers, does not lend itself to installation so readily as individual units.

There are makers whose product, although designed particularly for the car manufacturer, is also adaptable to the used machine. And there are some makers who have designed a moderately priced equipment for the used vehicle, and have in stock, brackets, pulleys, sprockets, chains, belts, etc., which enable the owner to equip his machine with electricity, and the majority of these may be fitted without any alterations.

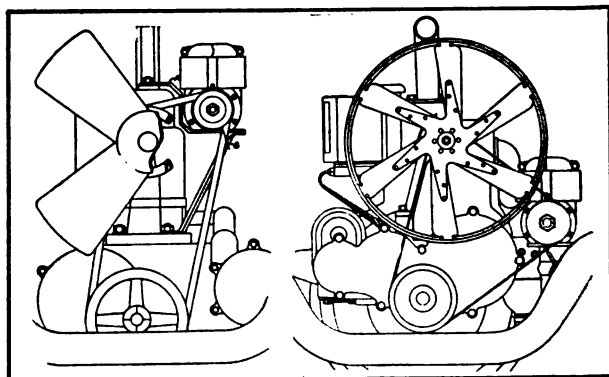


Fisher Generator on R-C-H.

system are informed as to the expense they drop the idea entirely and satisfy themselves with the old lamps until the purchase of another machine. This manufacturer, however, has marketed a number of

to, as the drive of the former need not be so positive; that is, there is no timing to be observed. It is simply a question of finding room enough under the hood for the installation of a small generator; fitting a bracket for its suspension and making provision for the drive. In 99 cases out of 100 the last named may be accomplished by means of chain, belt, shaft or gears. The average motor presents many opportunities for obtaining the drive, from the pump or magneto shaft, for example, as is demonstrated in accompanying illustrations showing a wide variety of installations.

When it is considered that approximately half a million cars were manufactured previous to the adoption of electric lighting, and that many of these give efficient service, the number of manufacturers making a specialty of electrical equipment for the used car is very limited. It is doubtless true that many owners are deterred from purchasing and installing the convenient



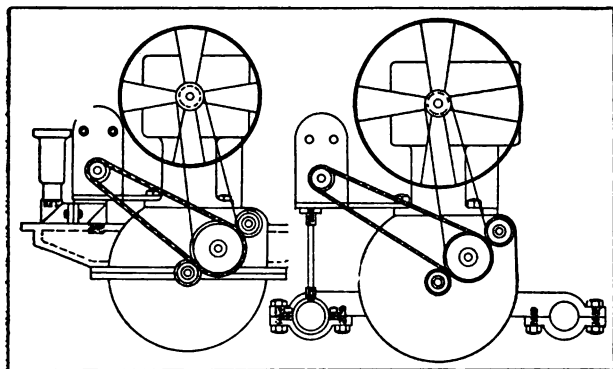
Showing Mounting and Method of Drive of Fisher Generator on Cadillac and Overland.

system because of the reasons previously explained, but during the present season a number of makers have brought out equipment for used vehicles. Several of these come complete for installation and the work may be performed by the owner, as not only are the instructions accompanying each outfit very complete, but the directions are easily followed.

In investigating lighting dynamos, their dimensions will have to be given consideration, and probable locations under the hood must be carefully measured to make sure there is ample space for the bracket or retaining member. The dimensions of several makes are given herewith and it will be noted that they include those of the side, bottom and end views, also the distances between the bolt holes, etc. In some instances a manufacturer produces several models, these having different capacity, as well as varying in size.

There are a number of possible locations on





Showing Method of Mounting Da-Lite Dynamo on Model C and T Regal Motors.

the power plant for the dynamo, and in considering these the drive is most important. The methods will differ with the design of the engine, but the almost universal arrangement is to mount a sprocket or pulley on some convenient shaft and drive from this by a silent chain or a belt.

An example of utilizing the magneto shaft is shown in the installation of an Aplco dynamo, made by the Apple Electric Company, Dayton, O., to a White car. It will be noted that a bracket is placed over the magneto and is secured to the frame and crankcase by bolts. By fitting a sprocket to the magneto shaft and aligning the driven sprocket of the dynamo, an ideal drive was obtained. Sometimes it is possible to fit a sprocket on the crankshaft or pumpshaft, and installations have been made where the fanshaft was utilized for the driving member. The Apple Electric Company issues a book showing a large number of installations and containing suggestions for selecting the proper equipment.

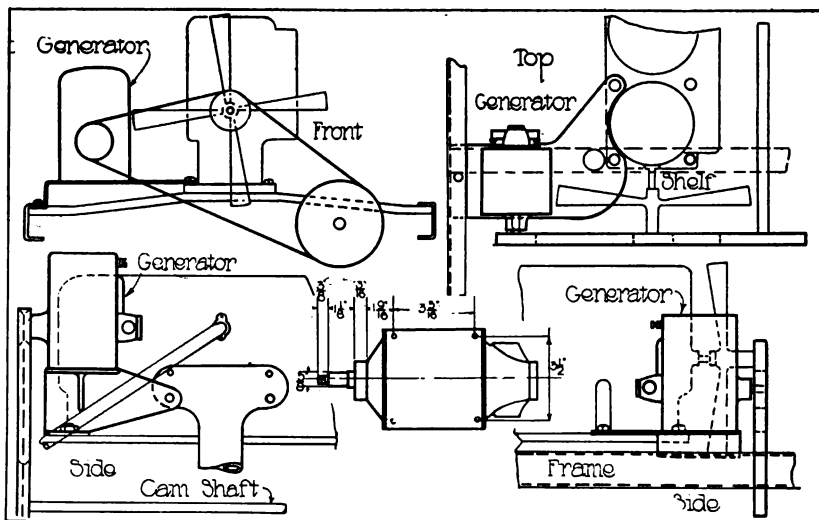
The cost of the lighting dynamo will vary from \$37.50 upward, and it may be purchased without the equipment. In addition to the dynamo and fittings necessary to drive it, there generally will be required: A storage battery, wiring, switch, ammeter, connectors and lamps. With some systems a regulator or cut-out device is required. The equipment will vary according to the system. Some manufacturers include all attachments and fittings with the exception of the lamps, while others believe that the choice of the equipment is best left to the purchaser, although suggestions are made as to its selection.

For the benefit of those who desire a moderately priced outfit, the figures presented in an accompanying table will be of interest. They are approximations only, and refer to a particular system. It may be assumed that they will be exceeded with some types of machines or cost less with others. The generator, ammeter and switch are listed at \$37.50, and the storage battery, a six-volt, 80 ampere-hour unit, as \$15.50. By fitting the gas headlights with nine-inch reflectors, for example, and at a cost of \$6, economy would be effected. The oil side and tail lights could be equipped with adapters at an expense of \$1.80

|   |                |
|---|----------------|
| Generator, ammeter and switch.....              | \$37.50        |
| Two 9-inch reflectors.....                      | 6.00           |
| Three adapters, two side, one tail.....         | 1.80           |
| Six-volt, 80 ampere-hour battery.....           | 15.50          |
| Two 6-volt, 15 candlepower headlight bulbs..... | 1.00           |
| Two 6 candlepower side light bulbs.....         | 1.00           |
| One 2 candlepower tail light bulb.....          | .50            |
| Bracket, pulleys and belt.....                  | 3.30           |
| <b>Total.....</b>                               | <b>\$66.60</b> |

and the five bulbs for \$2.50. The pulley, brackets and belt for the installation in mind, are listed at \$3.30, which brings the total cost of the equipment to \$66.60. No figures have been given on the wiring, but this would not be expensive. It is assumed that the motorist will install the dynamo himself, and as the attachments come complete and are designed particularly for the make of car utilized as an example, there is no reason why the work should not be entirely satisfactory.

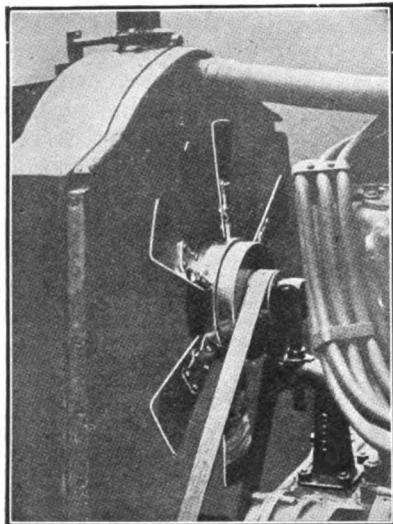
As previously stated, the figures are approximations only, especially those pertaining to the lamps, battery, bulbs, etc., and as these are pro-



Front, Top and Side View of Installation of Wells Generator to E-M-F Motor and Side View of System Applied to Detroit.



duced by a large number of concerns it is very likely that they can be purchased for less money. It should be borne in mind, however, that inferior equipment is dear at any price.



**Kemco, Which Replaces the Fan.**

In the matter of reflectors and wires, one should be careful to select only those marketed by a reliable concern, for poor lamps and wiring will handicap the most efficient generator.

In selecting the battery, the capacity recommended by the maker of the dynamo must be observed, as his knowledge is founded on experience. Elsewhere in this issue will be found directions for properly installing and caring for the battery, also suggestions for its proper maintenance in and out of service. Specific data as to the size of bulbs to employ with each system will be supplied by the maker of the dynamo, who will also furnish a wiring plan for any number of lights, and for including the ignition and electric horn in the system, if desired.

One of the concerns making a specialty of lighting equipment is the Fisher Electrical Works, Detroit, a number of installations on used and standard makes of machines being illustrated. That for the Hupmobile "32" requires only the drilling of two holes at A for securing the support E. The mounting includes the hanger F, which is bolted to the cylinder head at H, and the supporting member referred to. Drive is by belt, a special pulley being supplied with the equipment, and the driving member is depicted at L.

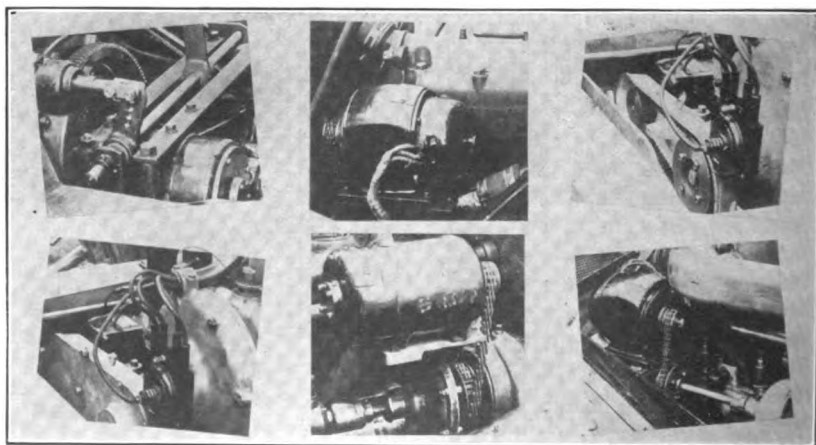
A special pulley H is also utilized in the equipment produced for R-C-H motors. The dynamo is supported by a bronze bracket A, which is bolted on the side of the cylinder at L and secured to the crankcase at E by the bolts T,

an installation requiring the drilling of two holes in the bracket. Drive is taken from a large pulley, the belt passing over and contacting with the fan pulley.

The method of mounting the Fisher dynamo on Cadillac models of 1910 and 1911 is also illustrated. The equipment includes a brass base plate A and support B, these being supplied with all holes drilled and ready for fitting, also a special grooved pulley on the generator. It will be noticed that the belt utilized is employed for driving the fan as well. The illustration drawn to scale in the same drawing and at the right, depicts the Fisher generator installed on Overland models and the maker states that it has given satisfaction, is easily attached and without alterations. The company manufactures a number of pulleys and brackets for standard makes of machines.

The Dayton-Dick Company, Quincy, Ill., maker of the Da-Lite generator, states that it has made a large number of installations on used cars, and an accompanying illustration presents front elevations of model T and C Regal motors, showing the manner of fitting and driving the dynamo. The company has also installed its system on the following makes of cars: Mitchell, Oldsmobile, Amplex, Glide, Colby, Knox, R-C-H, Packard, Tribune, Abbott-Detroit and Pierce-Arrow.

It will be noted that the fan drive pulley is replaced by one designed to carry both the fan belt and silent chain driving the generator, energy being supplied by a sprocket on the crankshaft. On the Regal car the dynamo is driven at twice the crankshaft speed. It is not essential to drive at this ratio as the company winds armatures for engine speed drive. The brackets em-



**Showing Method of Mounting and Driving Ward Leonard Systems: Upper Row, Left to Right, Application of Motor Starter to 1911 Peerless; Dynamo on Ford and Renault—Lower Row, Renault, Cole and Palmer-Singer.**



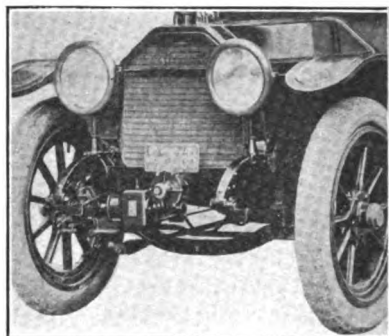
ployed in mounting are aluminum in the majority of installations, well braced and are bolted to the engine, as well as the chassis frame. Slight deviations are made in fitting the generator, according to the model of car, etc.

The Dayton-Dick Company will supply blue prints showing the method of mounting and driving its product on any car and after Dec. 1 it will be in a position to furnish complete details. The Da-Lite is similar in appearance to a magneto, has an overall length of 11.40625 inches, 4.3125-inch width and height of housing 7.625. Its weight is about 35 pounds. In commenting upon fitting the used car with electric lighting, the company states that no one desiring the equipment need have any hesitancy, as it can be installed so as to give efficient service.

The R. C. Wells Manufacturing Company, Fond Du Lac, Wis., is making the Wells lighting system, adapted to used cars, also a motor

space prevents giving details of each installation, but the illustrations demonstrate the practicality of fitting dynamos to the used vehicle.

A lighting dynamo which differs from those described, in that it replaces the fan, is the Kemco system, which was fully described and illustrated in the Sept. 25 issue of The Automobile



Disco Motor Starter on Peerless.

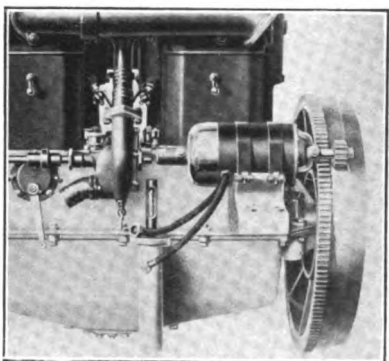
Journal. An accompanying illustration shows its installation on a Packard car and the simplicity of the design is apparent.

The selection of a motor starter requires even more careful consideration than the lighting generator, and while it is not always as easy to fit it as the dynamo, there are several makers who produce a system adaptable to the used machine. Manufacturers of the electric motor starter differ on the subject, some stating that it is as easy to install as a dynamo, while others contend that it is a manufacturer's proposition exclusively. Two illustrations presented herewith show the application of two different makes to used cars, also a view of the Universal starter made by the Disco Company, Detroit, which concern is to establish agencies throughout the country.

The Disco starter is installed by removing from the crankshaft the member with which the starting crank engages. Drive is by worm gear.

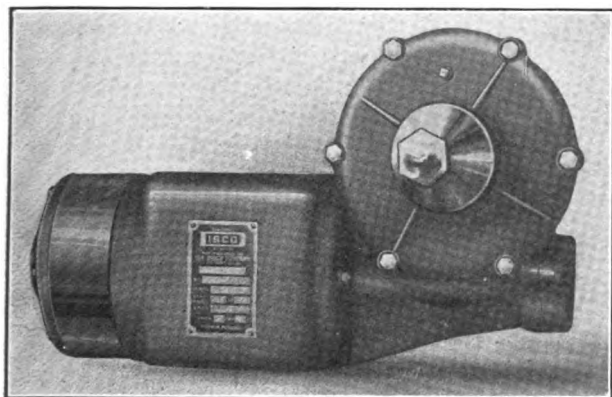
The Rushmore Dynamo Works, Plainfield, N.

J., manufactures the Rushmore motor starter, which is adapted to used cars and, through utilization of a patented end throw of the armature, the maker states it can be installed easily on any motor and



Application of Rushmore Starter to Simplex Motor.

without alterations. The armature of the starter carries a pinion which meshes with the flywheel, the periphery of which is fitted with teeth.



Disco Universal Electric Motor Starter Designed Especially for Application to Used Automobiles.

starter. The dynamo was designed especially for the used vehicle; is driven at 2.5 times engine speed and the automatic switch cutting in or out the current to the battery is incorporated in the dynamo. This system has been fitted to a number of used machines and side, front and top views of mounting the dynamo on an E-M-F are shown. Drive is taken from a pulley on the camshaft. An installation on a Detroit is also depicted and the dimensions of the generator are given.

Five methods of mounting and driving the Ward Leonard automatic dynamo lighting system are illustrated, these giving some idea of how energy may be supplied through a silent chain. It will be noted that in two instances the pumpshaft was fitted with the driving sprocket. Another view presents the location and manner of driving an Auto-Lite dynamo, made by the Electric Auto-Lite Company of Toledo, O. Lack of



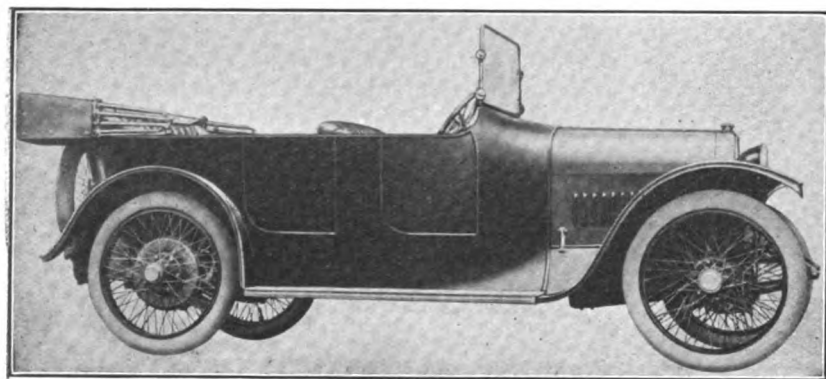
## MOLINE FEATURES KNIGHT MOTOR FOR 1914.

**F**OR some time it has been known that the Moline Automobile Company, East Moline, Ill., the officials of which are identical with those of the Root & Van Dervoort Engineering Company, was to incorporate changes in its 1914 design. The most pronounced is the adoption of the Knight sleeve valve motor, presenting a number of interesting features, the most noticeable of which is the utilization of a block casting, stated to be the first of its type produced in this country. Many refinements making for comfort, convenience and efficiency have been incorporated in the new chassis, which provides a longer wheelbase than the 1913 model, larger tires, wire wheels, new lighting and motor starting equipment, power tire pump, one-man top, etc. But one body is fitted, a streamline design, much lighter and roomier than this season's, and hav-

the entire length of the cylinder barrel, are completely surrounded with an unusually large water jacket. The cooling system presents a number of individual features of design and should insure efficient cooling. The cylinder heads are covered by a removable plate over the four cylinders, providing ample water space between the cover and head. Circulation is by thermo-siphon, a radical departure in the Knight motor. An equal flow of cooled fluid from the radiator is assured by the use of an intake manifold having two branches, one leading to the forward end and the other to the rear end of the lower edge of the cylinder block. The cooled fluid passes upward along the cylinder barrel, then around the intake and exhaust manifold, thence to the cylinder head and through the upper manifold or cover plate. The water headers are exceptionally

large in diameter. The cylinder covers are retained upon the cylinder by bronze nuts, eliminating opportunity for sticking.

As will be noted by an accompanying illustration, the cylinder head is a cone shaped cap with the spark plug located in its centre, extending into the combustion chamber to a depth of several inches. The space between the centre and sides of the cap are in the water circuit, so that the upper portions of the two reciprocating sleeves have water circulation on both sides



**New Moline-Knight, a Five and Seven-Passenger Touring Car, Fitted with Knight Sleeve Valve Motor, Wire Wheels, Electric Lighting and Starting.**

ing a capacity for seven persons, the tonneau being ironed for two extra seats.

The output of the Moline-Knight motor is ample to meet all requirements of service, the company guaranteeing it will develop 50 brake horsepower. It has developed 65 horsepower at 1800 revolutions a minute, at which point the tests were stopped on account of the limitations of the hydraulic dynamometer, although no indications were observable that the maximum power point was being approached. The rating appears to be conservative when it is considered that the Laurens-Klement car, made abroad, equipped with a Knight motor of the same dimensions, developed 74 horsepower at 2220 revolutions under test.

### Features of Cooling System.

Both the intake and exhaust manifolds are integral with the cylinders and they, as well as

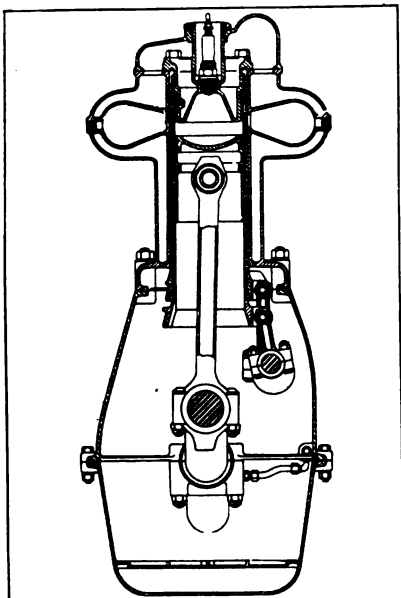
of them, and the upper half of the spherical combustion chamber is also surrounded by cooling fluid. With the exception of the ports and their extreme lower ends, the sleeves are water-jacketed. It will be noted from the cross sectional view that the spark plugs are located in little wells, which extend through the water jacket. This, with the conical cylinder cap and concave piston head, provides a combustion chamber very nearly approaching the ideal.

### Adjustment of Magneto Drive.

Another noticeable feature is the design of the sleeves. These are provided with a skirt or shelf. The sleeve valves are actuated by connecting rods from the eccentric shaft, which is driven by silent chain from the crankshaft. The chain also passes over the sprocket driving the magneto and lighting dynamo, the former being mounted on top and the latter on the underside of a base plate



on the left hand side of the motor. This base is carried on a long pin which acts as a pivot, allowing the magneto and generator to swing about it as a centre. Any elongation of the chain is compensated for by moving the shaft carrying the magneto sprocket in or out. Movement is provided by a bolt and nut arrangement on the timing gear housing, and the dynamo chain cover has slots instead of bolt holes to permit of movement between this member and timing chain housing.



Sectional View of Moline-Knight Cylinder.

The Moline Automobile Company has taken advantage of the opportunities offered by the sleeve valve motor for large valve openings, and those of the new motor are twice as great in area as those in the present poppet type of engine, even with the latter having slightly larger cylinder dimensions. Both the inlet and exhaust slots of the Moline-Knight are 3.875 inches in length, while the height of the inlet is .5 inch and that of the exhaust .625 inch.

Special attention has been given to the bearing design. The crankshaft is two inches in diameter, with the front and middle bearings 2.5 inches long and the rear member four in length. The eccentric bearings are 2.3125 inches in diameter and the eccentric pins 1.125 by 1.25 inches.

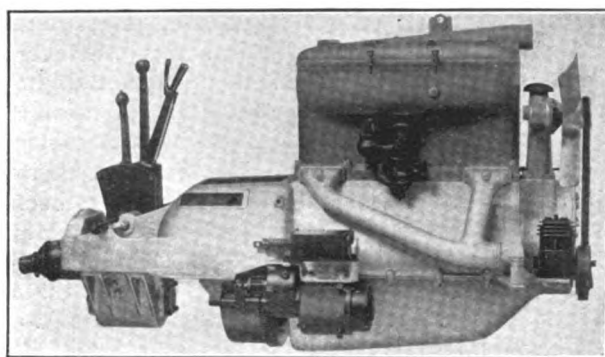
#### Efficient Lubricating System.

The connecting rods are hollow, true tubular sections, having a .875-inch hole, which plays an important role in the lubricating system. The oil is forced at pressure varying from 0 to 20 pounds through drilled crankshafts and hollow connecting rods to each motor bearing. Pressure and circulation are maintained by a gear pump which takes the lubricant from the sump in the bottom of the crankcase through a screen, forcing it through a manifold, which extends along the crankshaft bearing plate the entire length of the motor and parallel with the crankshaft. At the three main bearings leads conduct the oil to the crankshaft bearings.

Oil slots are not utilized, all motor bearings being floated on a film of lubricant, a practise in vogue abroad. At the main bearings, holes drilled in the crankshaft lead the oil to the connecting rod bearings, which are floated in the same manner. Here the drilled hole in the crankshaft registers once every revolution with a hole in the upper portion of the connecting rod bearings, which communicates with the hollow connecting rod. The last named is filled with oil, which is released in the same way to the wrist-pin. The latter is not locked in place. It comprises a tube riding freely in the piston and retained only by the lower half of the bottom ring of the three piston rings utilized.

A lead is provided to the idler of the chain drive, it also supplying lubricant to the bearings of the magneto shaft. The maximum oil pressure, 20 pounds to the square inch, is obtained only with the throttle wide open. The supply, therefore, is automatic, being proportional to the speed of the motor. Regulation of the pressure is obtained by means of a three-way cock connected with the throttle control mechanism and through which the lubricant is forced after it leaves the pump. The top openings are graduated so that with the throttle closed, the cock discharges oil directly into the sump, allowing but little to enter the leads to the bearings. With the opening of the throttle, the supply to the sump is decreased and that to the bearings increased, and at maximum opening the entire output of the pump is forced to the bearings. This provides a proper supply of lubricant at all motor speeds and eliminates smoking.

The suspension of the fan is very novel, as will be noted by one of the accompanying draw-

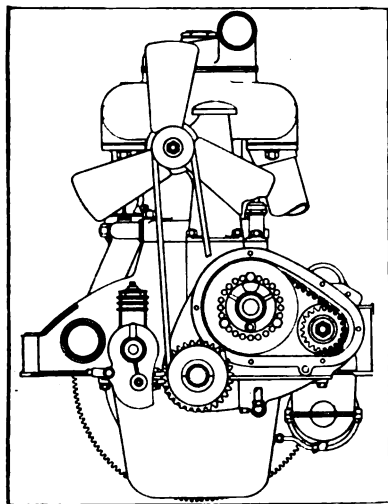


Intake Side of Moline-Knight Engine, Illustrating Location and Operation of Motor Starter—The Small Lever Is Utilized for Starting.

ings. It is a combination breather pipe and oil filler serving as a base for the fan bracket. The fan is belt driven from a small pulley on the



crankshaft. A two-cylinder gear driven tire pump is mounted at the forward end of the motor. Immediately behind the fan pulley there is a small



**Front View of Moline-Knight Motor.**

spur gear, and an idler gear always in mesh with the gear on the pump crankshaft. This idler gear is so pivoted that, by means of a lever, which projects to the front of the car under the radiator, it may be swung into mesh with the gear on the engine crankshaft. This arrangement permits of utilizing the pump without lifting the hood. These gears are not in mesh except when tires are to be inflated.

A specially designed Wagner two-unit lighting and motor starting system is utilized. The generator is inverted on the magneto plates and driven by enclosed chain from the magneto shaft. The energy of the motor starter is applied to a steel ring gearing cut on the periphery of the flywheel, rotating it at a speed of 120 revolutions a minute. The system is a 12-volt, and the use of a three-wire lighting system permits use of six-volt lamps. The battery is a 12-volt LBA, 80 ampere-hour capacity, and is located under the front seat. The method employed for operating the cranking switch differs from conventional practise. Instead of a pedal closing the circuit and sliding the driving gear into mesh, a lever, similar to the usual gearshift member, but slightly shorter, is located beside the latter. Ignition is by a Bosch magneto, carburetion by a Schebler.

The Moline-Knight motor is noticeable for its cleanliness of exterior and this practise has been carried further than ordinarily. The power plant is a unit, the motor, cone clutch and three speed gearset being combined and supported at three points, a suspension early advocated by the Moline Automobile Company. The motor will be finished in gray enamel baked on above the crankcase, the latter being of aluminum.

The chassis details are similar to those of 1913, refinements being made. The rear springs are now half-elliptic, instead of elliptic; are of the underslung type and are shackled at the rear of

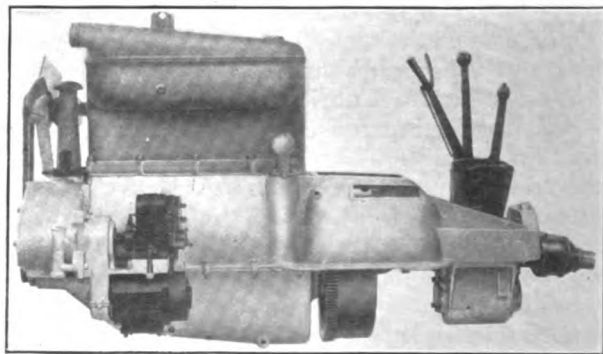
the frame. The axle is of the full floating type with wheels carried on double annular ball bearings. The rear construction is such that the axle shafts may be removed without disturbing or jacking up the wheels. The differential is suspended on roller bearings and adjustment is possible through the loosening of four bolts.

#### **Ample Braking Capacity.**

A pressed steel frame is utilized, with a drop over the rear wheels, bringing the body four inches nearer the ground than formerly and adding to the appearance of the car. The wheelbase has been increased four inches, being 128, while larger tires are fitted, these being 36 by 4.5 inches. The brake drums have a diameter of 16 inches and face of 2.5 and the emergency are of the expanding type fitted with a special lining applied to the inside of the drum. The service brakes are of the external contracting type. The fuel tank is now located at the rear of the chassis instead of under the cowl.

The new Moline-Knight body is very attractive in appearance. It is of the streamline design, fashioned after European practise, much roomier and lighter than the 1913 type. Viewed from the front it presents a continuous, unbroken curving line extending from the rear of the body to the radiator. The body line is not broken at the dash, and the rear part of the hood is flush with the cowl, so that there is no inset where the body and hood meet. The sides are high, being almost flush with the top of the back seats. The carrying capacity is ample for seven passengers and all of the five-passenger types are ironed for two extra seats.

The body is unusually well constructed and special attention has been given to prevent sagging and springing in service, which generally



**Exhaust Side of Moline-Knight Motor, Showing Method of Driving Magneto and Lighting Dynamo.**

result in sticking or ill fitting doors. Crowned fenders without rivets are employed. The Moline-Knight is fully equipped.



## HEATING THE GARAGE IN COLD WEATHER.

THE convenience of a heated garage appeals to all motorists. It not only prevents freezing of the cooling fluid and insures comfort when washing the car, but it makes possible easy starting of the motor. Storing a car in a cold, damp building results in deterioration. The finish is affected, the metal parts will tarnish and rust, and in low temperatures the lubricant will congeal, inviting mechanical troubles.

The Scientific Heater Company, 1125 Power avenue, Cleveland, O., has perfected a heater that will appeal to the motorist owning or leasing an unheated building. One of its qualities is that it requires no alteration of the garage building, such as installing boilers, etc., the fuel utilized being artificial or natural gas.

Owing to the fact that there is more or less gasoline vapor present in the garage, it is not practical to utilize any heating arrangement having an exposed or naked flame, as it is well known that the fumes of the fuel, being heavier than air, are present in clouds of vapor near the floor. The Scientific design embodies the same safety principles as the miner's lamp. It heats by the principle of air circulation; that is, it causes the air in the garage to circulate through the heater, up one side of the building, down the other, across the floor and again through the heater.

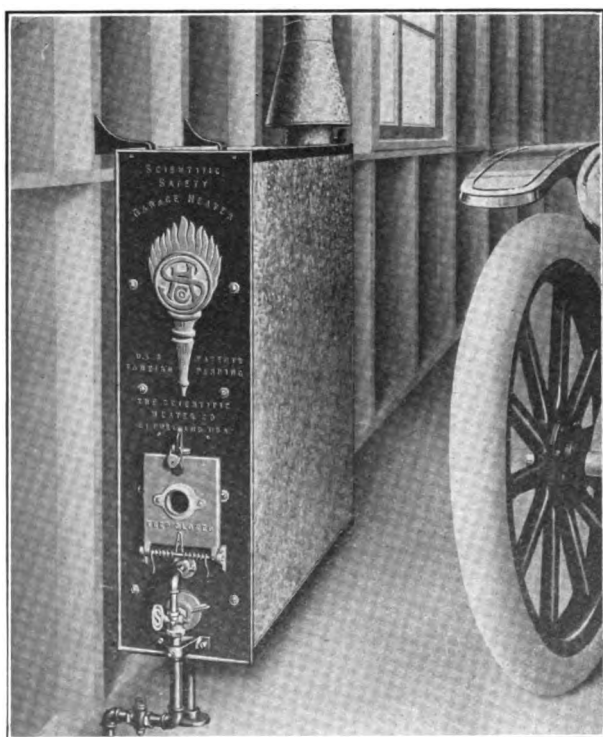
The maker states that the system is installed easily, the only expense being that of piping to the city mains, and that meter tests have shown that it is possible to operate it at a cost of a few cents a day. As will be noted by the accompanying illustration, which depicts the single type, a pilot light is incorporated, this being lighted at the beginning of the cold season and requiring no further attention.

Control is by a gas valve, it being a simple matter to regulate this to obtain the desired degree of heat. One of the features of the heater is the fire door, which may be locked to prevent its being tampered with. It is stated that the action of the system is very rapid, it being possible to raise the temperature from zero to a high degree in a very short time.

The design is very attractive, and, when mounted on brackets against the wall, that illustrated projects but 13.5 inches. It is 41 inches high and its body is 36 long—dimensions permitting of installation in garages where the space is limited. The front and back castings, and top and bottom reinforcing bars at the sides, are enamelled black. The sides are of extra quality

galvanized steel and all parts exposed to the gas fumes are of special acid proof iron. The company issues, free of charge, data on heating buildings of various dimensions, and both the single and double heaters are moderately priced.

The subject before the November meeting of the Detroit Section, Society of Automobile Engineers, was, "Shifting Gears by Electricity". Three papers were presented as follows: "A Specific Type of Electric Gear Shifter", W. A. McCarrell, chief engineer, Vulcan Motor Devices



**Scientific Safety Garage Heater, Utilizing Either Natural or Artificial Gas—It Is Also Made in Double Form for Large Buildings.**

Company, Philadelphia; "Electro-Magnets and Their Application to Gear Shifting", C. R. Underhill, chief electrical engineer, Acme Wire Company, New Haven, Conn., and "The Application of the Electric Gear Shift to the Haynes Car", Frank N. Nutt, chief engineer, Haynes Automobile Company, Kokomo, Ind.

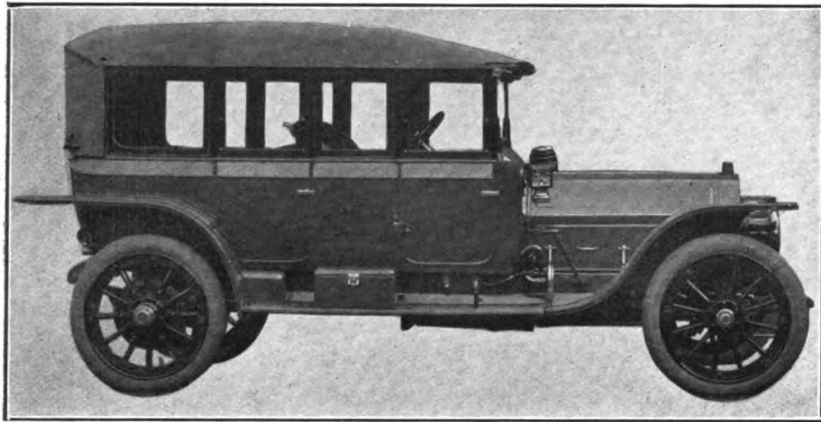
S. D. Waldon, vice president of the Packard Motor Car Company, Detroit, accompanied by M. J. Budlong, president of the Packard Motor Car Company of New York, is enjoying an European trip.



## CONVERTIBLE BODIES AND ONE-PERSON TOPS.

**W**ITH the automobile being utilized for more extended travel during the entire year the manufacturer is providing comforts and conven-

The Springfield Metal Body Company, Springfield, Mass., has been specializing on the convertible type for years and its product is well known to the industry. The details have been carefully worked out and by standardizing the parts, the company is able to build quickly bodies to suit the different types of chassis. The Springfield is rattle, dust, water and weather proof; its sides have large openings without posts or framing to obstruct the view other than the framing around the glass, and the occupants of the rear seat have a clear view at all times. The doors are wide, making for easy entrance and exit, and the same space and conveniences are provided as are



**Springfield Convertible Body, Providing the Motorist with Open Touring or Fully Enclosed Type, an All-the-Year Design, Presenting Interesting and Practical Advantages.**

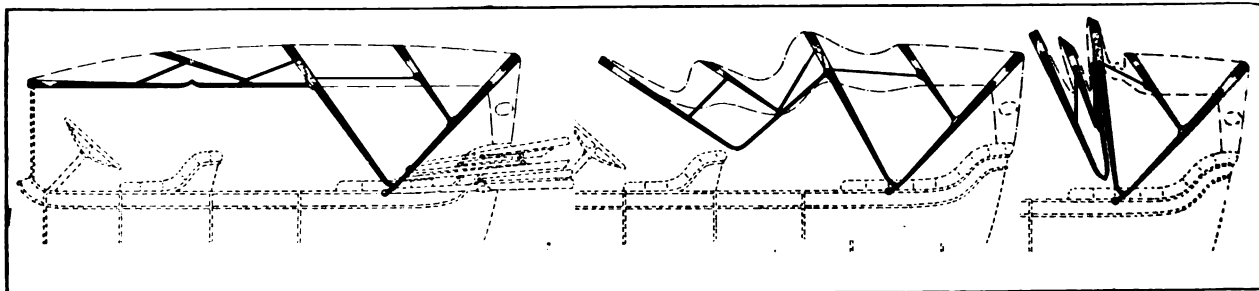
iences obtainable with other forms of modern transportation. The present body designs are in decided contrast with those of former years, when the occupants were subjected to draughts and many other inconveniences. One of the most interesting possibilities of body work is the convertible type, in that it provides the owner with an open touring body with top neatly folded out of the way, an ordinary canopy top, and a completely enclosed car with glass sides and door panels for winter use. It can also be made into a two-compartment design by the utilization of glass or curtains at the rear of the front seat.

In addition to the convertible idea, it has all of the advantages of the touring body and can be changed in a few minutes to the enclosed type, the placing of the glass frames taking less than three minutes, while two persons can lower the top without previous experience, other than that of knowing the method of procedure.

obtained with the limousine or enclosed types.

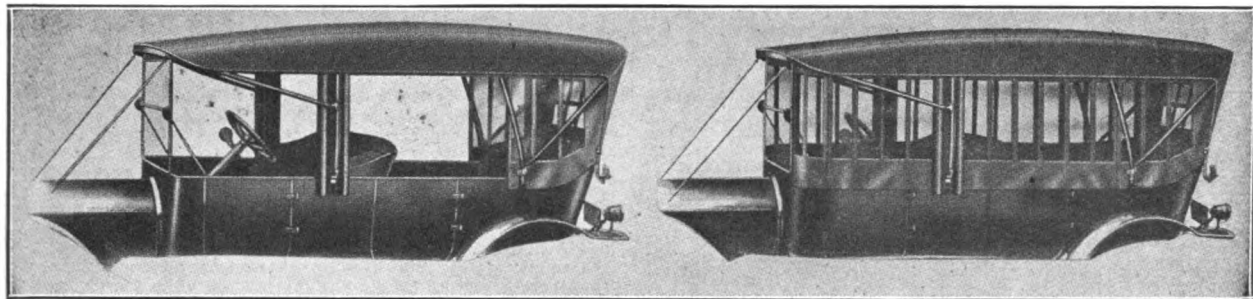
All bodies are made from sheet aluminum, with ash framing and steel forgings for body braces. The body top line is horizontal from the windshield post to the back upright. This top line is finished with a metal plate having a half-round rib extending lengthwise on the plate, and over this the rubber channel of the glass frames are guided and held in position.

The top structure is very light and the folding process is performed more easily than with conventional tops. As will be noted by an accompanying illustration, there are four windows on each side, or eight to a body, and four of these are permanently fastened to the doors by hinges. These hinges allow the frames to be revolved from the open to the closed position, and a spring tension constantly bears on the lever arm that locks the hinge in the two positions by engaging in a notch provided in the side of the hinge.



**Sharrer Patent One-Hand Top, Showing Method of Putting the Top Up—It is Retained in Position by Two Cables, and Straps Fasten the Front to the Dash.**





**New Scott Curtains: At Left, Fixtures Attached and Curtains Open; at Right, Curtains Drawn.**

All joints are screw retained, eliminating opportunity for rattling and the upholstery is in keeping with the comfortable design. The bodies are constructed both for touring and roadster cars and can be made to fit any standard chassis of modern manufacture.

#### **One-Person Tops.**

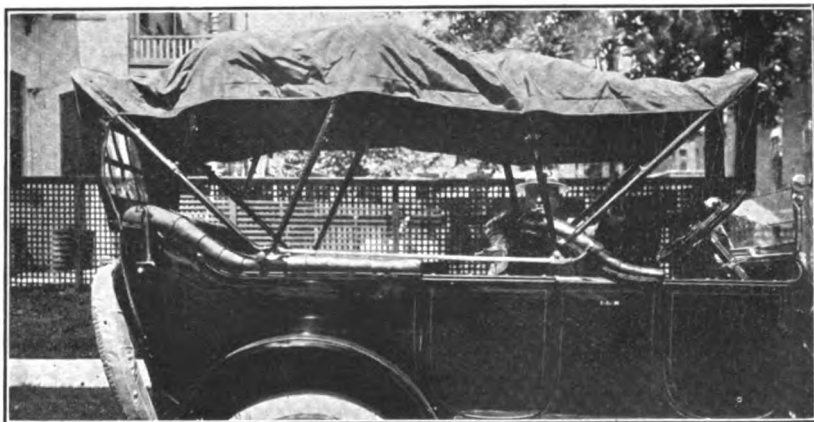
Tops quickly operated by one person make for convenience, and an accompanying illustration depicts the Sharrer patent one-hand top, made by the Sharrer Patent Top Company, New York City. It is attached to the body at only one point on each side of the rear seat, and in extending the top, the rear half is carried by two principal bows, which are supported by steel tubing, frames projecting forward and backward from the point of attachment at an angle, and by an intermediate bow secured to the rear main frame. The intermediate bow can be run from either the rear or auxiliary bows. Around the forward edge of the front extension is a frame with a hinge about the middle of its length. The forward fabric is supported by a bow hinged to the forward frame work and is braced by four short rods. It is, however, the flexible cable attached to the intermediate bow of the rear half of the top and running over two pulleys on the forward main bow, thence to the bow of the forward extension, which makes this construction possible. This invisible cable provides the top with support when extended and relieves the fabric of all strain.

When the forward straps are loosened, the top can be pushed back with one hand, as there is no weight to sustain, and the maker states that it is as easily put up. The Sharrer has a frame work of steel tubing and straight grained ash, and is finished as desired. The fabric is cravenette, pantasote or water proof mohair, and celluloid windows are fitted

in the sides and back. The maker claims it can be raised or lowered by one person inside the car and in less than 10 seconds.

The Simplex Specialties Company, Detroit, is marketing the Simplex top lifter, which has telescopic features and is adaptable to any top and car. It is made of seamless brass tubing, and castings are made to fit the socket on the front upright of the back bow, into which is inserted the front bow when the top is down. On account of the telescopic features the Simplex may be fitted to any car by drawing out the inner tube and inserting it into the body iron opposite the front seat. The lifter has a carriage with a tongue in which is a hole for inserting the front bow, and the operator after placing the lifter on the right hand side of the car, goes to the other side and operates the top much in the same manner as if he had a person on the other side. After the lifter has been used it can be removed and stored in the car. It is moderately priced and very compact.

Views are shown of the New Scott automobile curtains manufactured by the Star Storm Front Company, Troy, O. The fixtures are attached and removed instantly without leaving the car and all curtains are operated from inside.



**Simplex Auto Top Lifter, Attachment Permitting of Raising and Lowering the Top Easily by One Person, and Adaptable to Any Size Car.**



## MOTOR CAR HEATING SYSTEMS.

**B**Y UTILIZING some method of heating the motor car the discomforts attendant upon long rides in cold weather may be eliminated. Of



**Clark Indestructible Steel Heater with Drawer Removed to Show Brick of Fuel, Which Is Consumed Slowly.**

the systems marketed, the majority utilize either the heat of the exhaust or that of the motor, employing coils, registers, etc., for radiation. Generally the system can be installed easily and at a moderate cost.

### Clark Steel Heaters.

The Clark heater, made by the Chicago Flexible Shaft Company, Chicago, is well known to the carriage owner, having been on the market for a number of years. An accompanying illustration makes clear its construction, it being shown with the drawer removed and containing the brick of Clark carbon fuel. These heaters are constructed in various forms for motor cars and have indestructible steel bodies with ends nickel plated. The ends and sides are fitted with adjustable ventilators, permitting of regulating the heat. Brussels carpet, mohair and velvet plush are utilized for upholstering and in colors to match the finish of the car. The fuel is carbon, specially prepared and compressed into bricks, which are stated to yield a much higher percentage of heat than any other fuel. The maker claims that one brick will supply a strong and steady heat for a period of from 12 to 16 hours. The bricks come in cartons, each containing 12, and are inexpensive.

The Reynolds heater, manufactured by the Reynolds Dull Flasher Company, Chicago, is practically a register which is located in the foot-board of the car and which permits heat from the motor to pass to the front compartment. The maker states that a certain amount of fresh air is drawn in with the heat and that the system not only maintains a comfortable body temperature, but the feet are kept warm. The Reynolds is attached by a few screws and control of the heat is by a hinged shutter, which is reversible for convenience in installation and operation.

The Garrison heater, made by H. Garrison, Philadelphia, is adaptable to any type of body, although it is designed particularly for the enclosed car. It is constructed in three styles, for the right, left or the floor of the machine at the front.

When located in the front compartment it does not prevent access to the transmission, etc. The heater is easily installed, the register being fitted in the floorboard and connected to the exhaust by tubing. Regulation of the supply is by a two-way valve.

### Four-In-One.

The Auto Heater Company of America, 1148 Bedford avenue, Brooklyn, N. Y., is producing the Four-In-One heater, which is a complete equipment, and the maker claims it can be installed in 30 minutes. It comprises a register, to which the exhaust is conveyed by a flexible pipe, and a valve attached to the other end of the tube. The latter has an inlet and exhaust nipple, into which are set the ends of the exhaust pipe, a section of which is removed to fit the valve.

The heater valve contains a rotor, the blades of which are revolved by the energy of the exhaust, causing a port in the valve disc to register at regular intervals with the pipe leading to the radiator or register in the body of the car. This arrangement, the maker points out, allows a predetermined amount of heat to flow through the register, the lighter gases being utilized. The heavier pass on to the muffler.

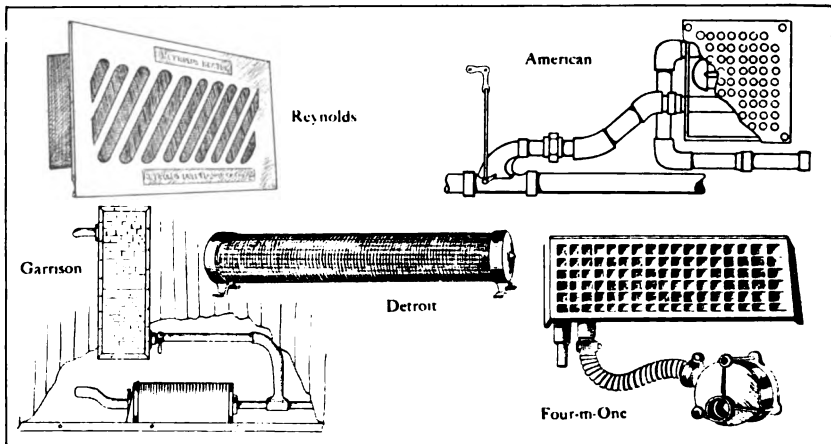
Control of the valve is by a rod which may be carried to any convenient place for operation. The maker claims that back pressure is considerably reduced by the increased space provided for the expansion of the gases, and that the rotor muffles the sound of the exhaust. The radiators are constructed of a light metal and it is maintained that the car will be warmed within a few minutes after the motor is started. The Four-In-One may be installed in either the front or rear compartment, or both.

### American.

The exhaust is also utilized in the American, manufactured by the American Auto-Heater Company, Buffalo, N. Y. A special valve, controlled by a cable with a regulating member convenient to the driver, is placed in the exhaust line between the engine and the muffler. The exhaust passes through coils of radiating tubes, heating an aluminum register, thence to a separate miniature muffler, which is utilized to carry off all odor, etc., and as a silencer much in the same manner as the conventional muffler. The register is fitted in the floor, is 10 inches square and three deep, highly polished and perforated to allow the heat to enter the car. The temperature may be controlled by the driver or the heat shut off as desired.

### Detroit.

The Detroit, manufactured by the Detroit Auto Heater Company, Detroit, is another which employs the exhaust, but the installation includes a heater for the front compartment or driver, as well as the tonneau. A regulating valve is located in the exhaust line between the engine and muffler, and the heat passes to the forward radiator, thence to the rear member and back to the exhaust line. Flexible steel hose is utilized and all parts are aluminum or nickel plated. The radiator is neat in appearance, and the system may be installed easily. It is adapted to roadsters, as well as to the enclosed types of cars.





## TYPES OF PRIMING SPARK PLUGS.

ONE of the best known methods of starting cold motors is to prime cylinders by injecting a small quantity of gasoline or other highly volatile fluid into the combustion chamber through the petcocks. This pro-

The AC, manufactured by the Champion Ignition Company, Flint, Mich., differs from those above described in that a thumb nut is utilized, and the maker claims that a gas tight construction is obtained by a valve placed in such manner that the compression of the cylinder has a tendency to keep it shut. It is also stated that the plug has been tested with the thumb nut loose and the effect of the compression was sufficient to keep it gas tight.

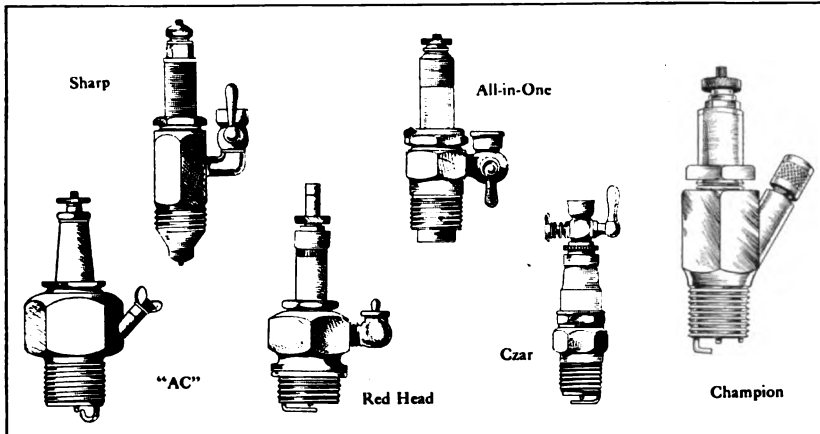
A form of needle valve construction threaded into an extension of the shell, and controlling a passage communicating with an opening in the wall of the base, is the feature of the Champion priming plug, manufactured by the Champion Spark Plug Company, Toledo, O. The knurled head of the controlling valve is provided with a cup shaped recess, which communicates with the shell passage, permitting the fuel to flow to the cylinder.

The manufacturers of these plugs construct them in .5 inch standard, .875 A. L. A. M., and metric. They are also made with the hexagonal or threaded section, long or short, to conform to the various types of valve caps and motors. Special designs adapted particularly to the model T Ford motor are described and illustrated in the Ford section of this issue.

### J. H. S. SHOCK ABSORBER.

The J. H. Sager Company, Rochester, N. Y., well known maker of the Sager equalizing springs, bumpers and motor car specialties, has brought out a new shock absorber named the J. H. S., which is distinctly different from conventional designs. As will be noted by the accompanying illustrations showing the J. H. S. attached to the full and three-quarter elliptic types of springs, it comprises a pair of cylinders constructed similarly to those of the hydrocarbon motor in that a piston is employed. This piston acts in harmony with the coiled springs to destroy all shocks, automatically taking up all jars and jolts, regardless of whether the car be loaded or empty. All parts are substantial, fully protected from road dust and foreign elements, and emphasis is laid upon their durability.

The guarantee is unusually liberal, the J. H. Sager Company offering to replace free of charge any broken spring or its attachment within one year from the date of purchase. A special free trial offer is also made.



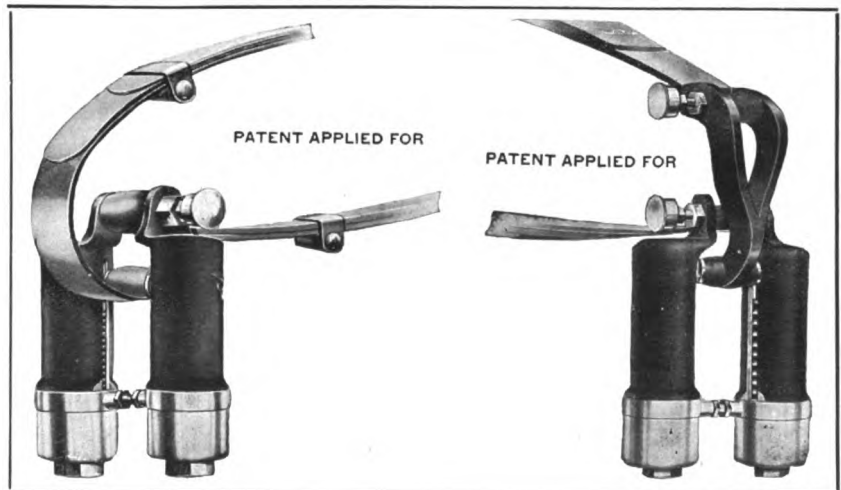
vides a rich mixture, one that will ignite easily, provided, however, too much fuel is not utilized. While the modern motor is fitted with priming cocks, there are a number of old cars, and a few new models, not thus equipped, necessitating the removal of the spark plugs.

The priming spark plug differs from the standard types in that means are provided for injecting fuel, and in some designs the hexagonal and threaded sections are made longer. Those of the petcock type permit the fuel to flow through a passage in the shell and to the sparking points, while in others the fuel is introduced by means of a passage in the shell itself.

One of the best known priming spark plugs is the All-In-One, made by the Frontier Specialty Company, Buffalo, N. Y. It comprises a priming cup with a lever, and one of its features is that it is perfectly gas tight when the lever is placed in a vertical position. It is utilized in the same manner as a conventional petcock in priming, and the capacity of the cup is such as to provide the amount of fuel necessary to insure an easily ignited mixture. In addition to being useful for priming purposes, the All-In-One may be employed for introducing a decarbonizer, and for locating a missing cylinder. It is produced in vertical and horizontal types and for every make of motor.

The Frontier Specialty Company also manufactures the Czar priming plug, the priming passage of which is controlled by the regular style of priming cup, which embodies in its construction a brass key ground to a perfect seat in the cup body. A heavy spring maintains tension and eliminates opportunity of leakage. The slip collar, which is threaded on the lower end of the cup, permits the use of ordinary spring connections, also wire or flat terminals, and can be screwed either up or down to conform to the thickness of the wire or terminal. The cup is made to fit the end of the ordinary gasoline can, so that the fuel may be injected directly through the hollow electrode into the combustion chamber. It is made in various threads.

The Red Head, made by Emil Grossman, New York City, and the Sharp, manufactured by the Sharp Spark Plug Company, Cleveland, O., utilize priming cups and in the latter the fuel flows down the inner wall of the secondary combustion chamber directly over firing points.



New J. H. S. Shock Absorbers Fitted to Three-Quarter and Full Elliptic Springs.



## CARE OF STORAGE BATTERIES.

Attention Cells Should Receive When in and out of Service, and Practical Tests That Will Insure Efficiency Without Deterioration.

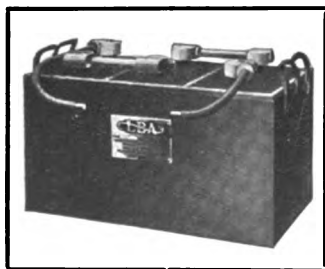
**E**FFICIENCY with electric lighting or motor starting systems, as applied to the automobile depends upon the storage battery, and when it is considered that the electricity derived is due to chemical action and reaction, it follows that the cells must be given proper attention if satisfactory results are to be secured.

With the lighting and motor starting systems the charging of the cells is accomplished by the generator, and, as the battery is not removed except for repairs or in the event of an accident, the care of the cells must be assumed by the motorist or by the battery expert. It is not the purpose of the writer to discuss the construction of batteries,

other than to state that the lead type consists, briefly, of positive and negative plates, separators, sulphuric acid and hard rubber containing jars. The positive plates comprise supporting and current conducting grids, and active material in the form of red-brown lead peroxide, while the negative plates are similar grids and a peculiar amorphous form of metallic lead known as sponge lead.

During the discharge a reaction takes place, the plates absorbing sulphuric acid from the electrolyte and part of the lead sponge changes to lead sulphate. To secure maximum efficiency from the cells both of the elements must be maintained in good condition with the same charging treatment, because, apparently, treat-

ments which are beneficial to the positive are harmful to the negative, and vice versa. Conditions may be so adjusted, however, as to keep both positive and negative in perfect shape.



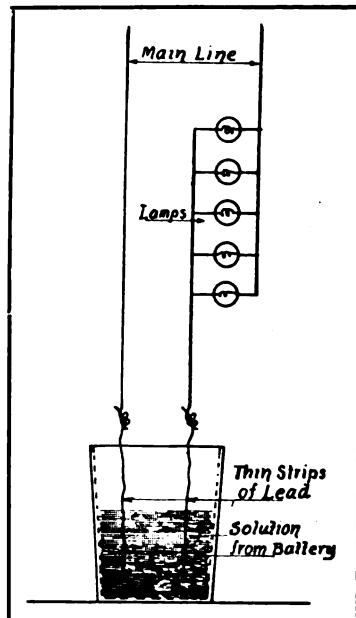
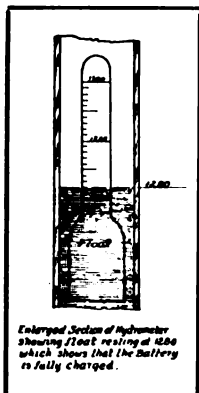
LBA Storage Battery.

One of the most important rules to observe in the care and maintenance of batteries is to keep the electrolyte at the proper height indicated by the maker. This

lever is indicated for an LBA battery, made by the Willard Storage Battery, Cleveland, O., in an accompanying illustration. Distilled water is vastly preferable, although clean rain water or melted artificial ice may be utilized. Distilled water is not expensive and the motorist is assured of a fluid free from all impurities. Inspect the battery once in two weeks in cold weather, adding the water as needed, and never allow the solution to get below the top of the plates. It is equally important to use clean vessels in replenishing the supply.

The best method to use in ascertaining the condition of the cells is to test the specific gravity of each with a hydrometer, and the readings should be taken before adding water. The instrument utilized is shown in an accompanying illustration, the electrolyte being drawn into it by compressing and releasing the bulb, thus drawing up the electrolyte until the hydrometer floats. The reading on the graduated stem of the hydrometer at the point where it emerges from the solution is the specific gravity of the electrolyte. An enlarged section is depicted, showing the float resting at 1.280, and denoting that the battery is fully charged. After testing, return the electrolyte to the cell.

The gravity reading is expressed in points. Thus, the difference between 1.275 and 1.300 is 25 points. When all cells are in good condition the gravity will test about the same (within 25 points) in all. Gravity above 1.200 indicates that the battery is more than half charged. Below 1.200, but above 1.150, indicates less than



Charging from Direct Current with Lamps for Resistance.



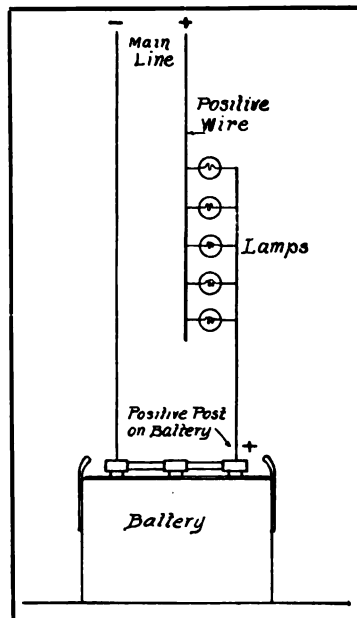
half charged. Gravity below 1.150 indicates that the cells are completely discharged or run down and that they should be recharged.

Never put acid or electrolyte into the cells to bring up the specific gravity, as harm may result. Acid should not be supplied except by a battery expert. A battery charge is complete when, with charging current flowing at the finish rate given on the instruction plate on the battery, all cells are gassing (bubbling) freely and evenly, and the gravity of the cells has shown no further rise during one hour. The gravity of the solution on cells fully charged is 1.275 to 1.300.

This recharging can preferably be done by running the engine until the specific gravity shows that the cells are fully charged. If this be not convenient it may be accomplished by means of a rectifier with an alternating current or by lamp resistance where direct current is available. The better method is to displace the battery and have it charged by the expert.

When charging from 110-volt direct current with bulbs for resistance, use the finish charging rate given on the name plate of the battery. This rate determines the number of lamps to be used

ing it a freshening charge at least once a month, but in addition it should preferably be given a thorough charge after a period of inactivity before it is replaced in service. This may be accomplished by operating the engine as previously explained. When not in service it is recommended that the leads be disconnected, avoiding any opportunity of leakage through short circuits due to chafed or defective leads of the wiring system.



Method of Locating Positive Wire of Charging Circuit.



Hydrometer Syringe for Testing Specific Gravity of Electrolyte.

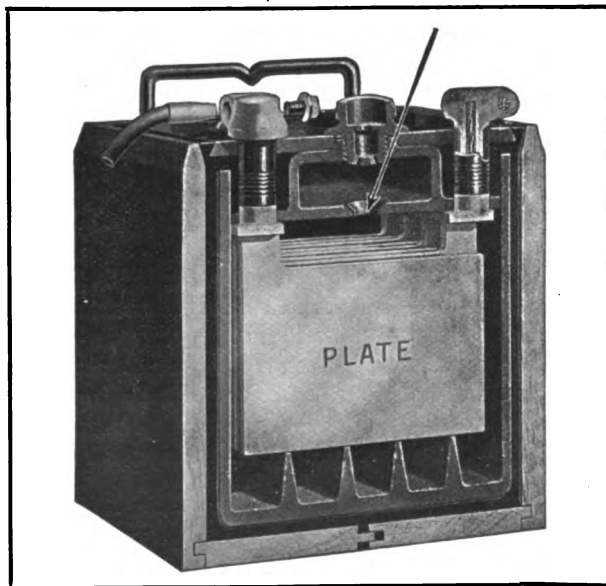
as follows: One 32 candlepower lamp for resistance gives one ampere; one 16 candlepower, .5 ampere. For example: For an 80 ampere-hour LBA battery, the finish rate is five amperes and the cells will require five 32 candlepower lamps or 10 16 candlepower bulbs. To fully charge an empty battery by this method, leave it connected to the circuit for one period of 24 hours or two periods of 12, or until each cell gasses freely and shows a specific gravity ranging between 1.275 and 1.300.

In charging, care must be taken to connect the positive wire of the circuit with the positive of the battery. To ascertain the positive wire from the charging current, draw a little solution from a cell and place it in a clean tumbler with a strip of lead attached to each wire. Turn on the current for a few minutes. The strip of metal that turns brown is the positive wire and is connected to the positive post of the battery. Before charging, the cells must be filled with distilled water as previously explained.

A battery which is to stand idle, as during the winter months, should first be fully charged. It may be kept in condition for service by giv-

In storing a battery for the winter the maker of the LBA advises placing it where the temperature does not fall below 20 degrees above zero Fahrenheit, or maintaining the cells in a fully charged condition. For the benefit of users of lighting and motor starting batteries it may be stated that the electrolyte will not freeze with the cells fully charged in temperatures ordinarily met.

In caring for the battery in service it is im-



Cells Should Be Filled with Distilled Water to Line Indicated in Section View of LBA Battery.



portant that its exterior and the interior of the battery box be kept clean and dry. Keep the terminals and connectors coated with vaseline and remove any spilled electrolyte with waste moistened with ammonia. Metal articles should not be carried in the battery box. Do not bring a naked flame in proximity to the battery as during the gassing a very inflammable vapor is given off and some of it may be present in the box when chemical action is not taking place.

### PREPARES FOR BIG BUSINESS.

#### Haynes Automobile Company to Increase Production to 5000 Cars.

Announcement is made by the Haynes Automobile Company, Kokomo, Ind., that it is preparing to increase its production to 5000 cars.



**R. C. Hoffman, Chief Draughtsman,  
Haynes Automobile Company.**

The demand for the product of this pioneer concern is said to have been exceptionally large this season, and the company suggests that the adoption of the Vulcan electric gearshift has been one of the features which has been a deciding factor with the general public.

although it hardly will be contended that the popularity of the Haynes product is dependent entirely upon any one feature.

In order to prepare for increased business, President Elwood Haynes is adding to the sales and technical forces, and among the latest acquisitions is R. C. Hoffman, who until recently was identified with the J. I. Case Threshing Machine Company, Racine, Wis. Mr. Hoffman becomes chief draughtsman for the Haynes organization.

Other recent appointments include: L. C. Burnett, district sales manager in the Northwest, with headquarters in Minneapolis, who comes from the Peckham Motor Car Company, Dayton,

Batteries must be fastened securely, be accessible for inspection and for adding water, and the battery compartment should be well ventilated and drained. Free air space should be provided on all sides. The battery should rest on cleats, rather than on a solid bottom, and the holding devices should grip the handles. Covers, cleats or bars must not be utilized on the tops of the battery to retain it in position. All dirt, water and foreign elements should be excluded.

O., of which concern he was secretary and general manager; F. A. Fisher, at one time identified with the eastern Canadian distributor for the Stutz, who becomes Haynes district sales manager in the same territory with headquarters at Toronto, and J. S. Stark, a recruit from the Michigan Buggy Company's force, who represents the Haynes in Indiana, with headquarters in Elkhart.

### THE NATIONAL'S POLICY.

#### General Manager George M. Dickson Explains Its Essential Features.

Believing that the purchaser of motor cars, as well as the dealer, is vitally interested in the character of the company with whom he is doing business, General Manager George M. Dickson of the National Motor Vehicle Company, Indianapolis, Ind., invites investigation of the concern producing National cars. He adds that it is possible to purchase these machines as a complete, reliable unit, in which every mechanical part operates harmoniously to produce satisfactory results. He says:

The National is built on the series basis, every day beginning a new year. Improvements do not wait upon the calendar. Nor do we make changes for the mere sake of changing. We do not upset our manufacturing efficiency by forcing yearly models. We have no fundamental faults to disguise by changing body style, no more than we try to divert attention from quality by pointing to mere specifications.

Test the National for all you demand of a car. Buy it then, without the trouble of attempting to be an expert on every mechanical reason incorporated into the car's unit of construction. A single feature is good only in its relative position to all the rest of the car. We put the right material in the right place. Our experts devote their lives to this duty. We take that responsibility. You enjoy the results.

Representatives of more than 20 per cent. of the largest creditors of the Dean Electric Company, Elyria, O., whose claims amount to over 80 per cent. of the full indebtedness of the company, met in Cleveland, O., early in the month and appointed a creditor's protective committee, consisting of A. L. Garford, C. H. Gale, J. M. Lenz, C. E. Lozier and W. M. Pattison.



## PREPARATIONS FOR WINTER SERVICE.

The Attention Necessary to Insure That the Chassis Is in Condition for Continued Use, and Suggestions for Inspecting, Adjusting and Restoration.

THE preparation of the motor car for winter service involves, in addition to equipment making for comfort and convenience in operation, a partial or complete overhaul of the chassis, the extent of which will depend upon its condition, service expected, etc. The machine purchased in the spring may not require other than a general inspection and adjustment of parts, the removal of carbon and the grinding in of the valves. On the other hand, an old model may need considerable attention, including machine work and the replacement of worn parts with new. It should be borne in mind that certain components of the chassis are subjected to more severe stresses in cold weather than in the sum-

mer, and a set of automobile mechanical handbooks (published by The Automobile Journal Publishing Company) may be procured for a small sum, there is no reason why the new owner should not become thoroughly acquainted with the components of the motor vehicle and their relation to one another.

### Tools and Supplies.

Lack of space prevents enumerating the tools and supplies required. If the usual equipment is fairly complete, the addition of a wrench set or a set of S wrenches will suffice, but if larger and heavier tools are needed they may be obtained from a neighboring motorist or purchased. The supplies may be secured as required. The

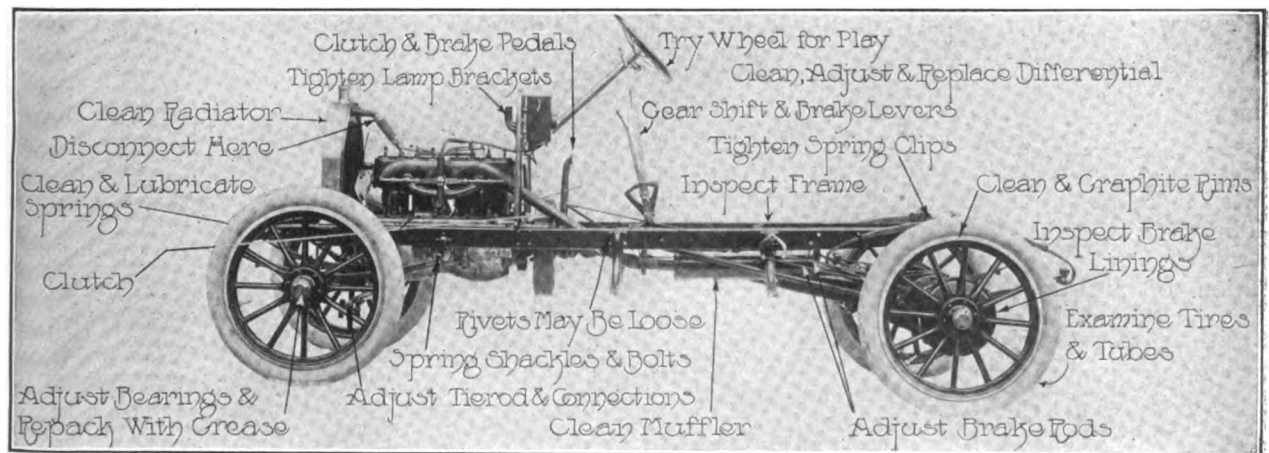


Fig. 1.—Suggested Inspection of Chassis and Parts That May Require Attention in Preparing Car for the Road.

mer because of the condition of the thoroughfares traversed.

It is not presumed that the novice will be able to successfully complete a thorough overhaul of the chassis, but much of the work may be accomplished and those components requiring experience in adjustment may be left to the expert. In this connection it may be stated that it is possible to secure the services of a thoroughly competent workman who makes a specialty of repairing in the garage of the owner. With labor costing from 60 cents an hour upward, to say nothing of the helper, it is obvious that the owner can considerably reduce the cost of the overhaul by undertaking certain work. Inasmuch as the manufacturer generally supplies an instruction

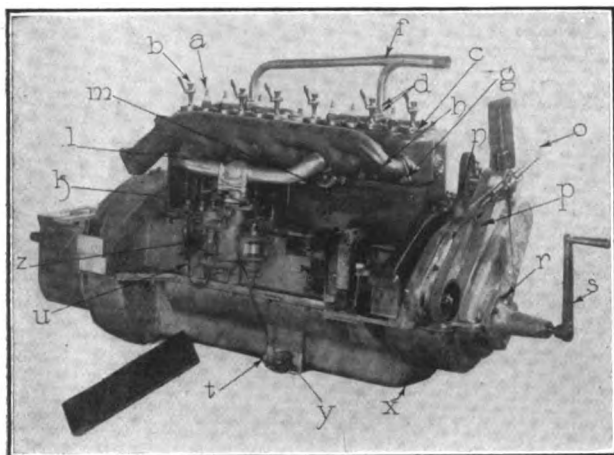
necessary material, including new parts, may be listed during the disassembling and it is suggested that these be set down as the work progresses. It will save time, in that the new part may be ordered and received before needed.

### Removing the Body.

Before beginning the work it is advised that a thorough study be made of the various groups of the chassis and the instruction book will be of value in this respect. Assuming that the overhaul is to be very thorough, the first step is to wash the car, then strip it of all accessories, including those stored in the body compartments. Care for the top and curtains as outlined on page 56.

Before attempting to remove the body ex-





**Fig. 2—Components of Motor Lettered in Alphabetical Order to Simplify Work of Disassembling—To Reassemble, Reverse the Order.**

amine all ignition, lubrication, lighting, fuel, etc., connections located on the dash or body, marking them with tags for identification, and make sure that the body is free before lifting it from the chassis. With the fuel tank under the seat it will be necessary to disconnect at the unions and it is well to drain the container. The body may be lifted by a falls and tackle, or by several persons, and placed on stands, etc. Previous to this work, it is advisable to flush out the radiator with a soda solution or a marketed preparation. The work was described in detail in the Oct. 25 issue of *The Automobile Journal* and the preparation of anti-freezing solutions was also outlined.

After displacing the body roll the chassis out of doors for the cleaning process, if the garage be not equipped with a washstand. Grease and foreign deposits may be removed with a brush dipped in gasoline or a compressed air type of cleaner may be utilized, employing a fluid. These are not expensive and one can be made by taking a gallon can, fitting a tire valve, and attaching a tube and a nozzle having a

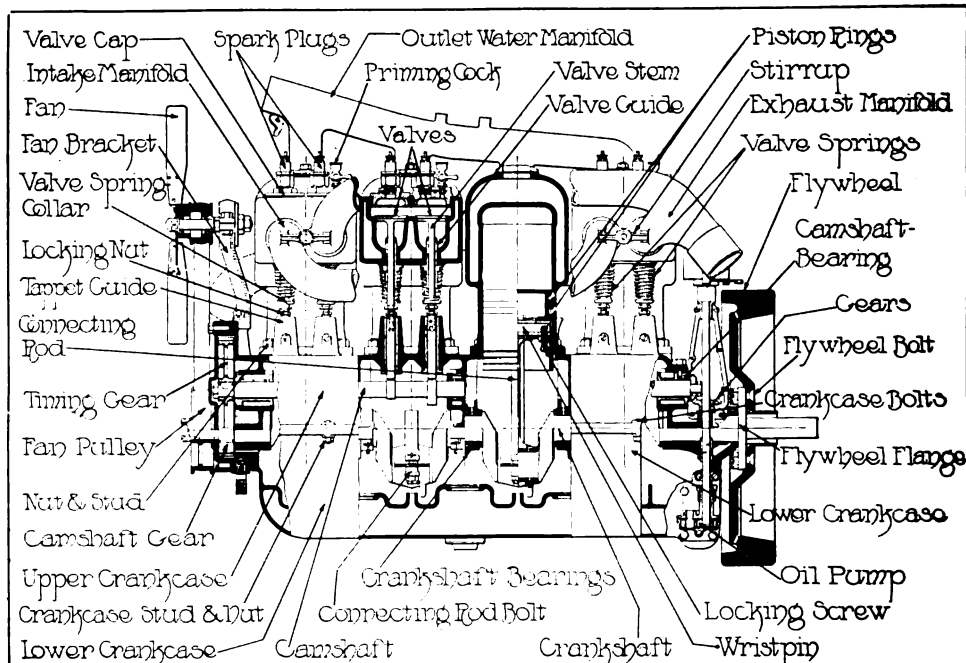
fine opening. Pressure is secured by using a pump and control is possible by fitting a petcock in the line. In cleaning the motor, cover the magneto, carburetor, lighting generator and motor starter.

### Removing the Power Plant.

It is assumed that the radiator has been drained. Next study the cooling system thoroughly before attempting to detach the pipes or separate connections. The illustrations at Figs. 1, 2 and 3 will be of value in this work, outlining as they do the components of the thermo-syphon and pump methods of circulation. If the equipment includes a dynamo and motor starter, the instruction book should be consulted, the wiring plan studied, and all leads tagged. It is well to be very thorough in the work, as it will save trouble in the assembly.

Next remove the radiator, and if it has been leaking, send it to an expert for repairs. Handle the cooler carefully as it is damaged easily. Examine all tubing, and if the layers of fabric are loose, make a note to purchase new piping. It may be secured at any rubber house and the old tube will be useful to obtain correct lengths, etc. If careful, the old clamps or wire may be utilized.

It is difficult to give other than general directions for removing the power plant as the construction varies. Some motors may be removed easily, while other designs will require a study of the method of retention. The unit type—the motor, clutch and transmission—is handled fairly



**Fig. 3—Components of the Power Plant Lettered to Simplify the Work of the Overhaul and to Show Their Relation to One Another.**



easily, especially when the gear shifting and emergency brake levers are incorporated with it. A careful inspection of the drive from the motor when the transmission is a separate unit, should enable one, with the aid of the instruction book, to free the engine from all driven mechanism. The object of removing the power plant to the motor stand is to facilitate the work of adjusting bearings, etc., but in the majority of overhauls the motor may be left in the frame.

For the benefit of those not familiar with the components of a motor and clutch, the chart presented at Fig. 3 will be of value. The illustration at Fig. 2 presents the exterior of a motor and it will be noted that the parts are alphabetically lettered to show the order of disassembly. Clean the work bench and its shelves and have a number of wooden boxes for the nuts and bolts removed from the motor, etc. Where possible, replace these members after disassembling the

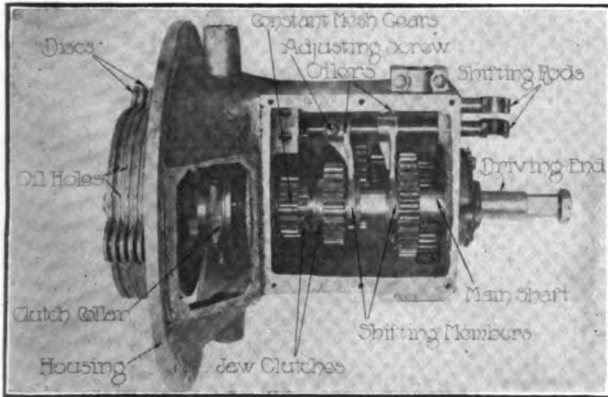


Fig. 4—Unit Clutch of Multiple Disc Type and Transmission, with Components Lettered.

part as it not only will insure using the proper nut, but will save considerable time.

#### Disassembling the Motor.

To strip the motor of exterior components use the chart at Fig. 2. First, remove the spark plugs a, placing them to one side for inspection and cleaning, then take out the priming cocks b. The valve caps c may be removed with a special wrench and placed in order on the shelf of the bench for cleaning. Next, disconnect the pipe leading to the muffler. The water manifold f is retained by bolts d and by displacing the former carefully the gaskets may be saved. The exhaust manifold h is secured by nuts, one of which is shown at g, and in loosening these, slack each off a little at a time. Steady the manifold when removing and preserve the gaskets if possible.

The intake manifold i is similarly retained, but before loosening the nuts take out the bolts k, being careful not to exert undue strain upon

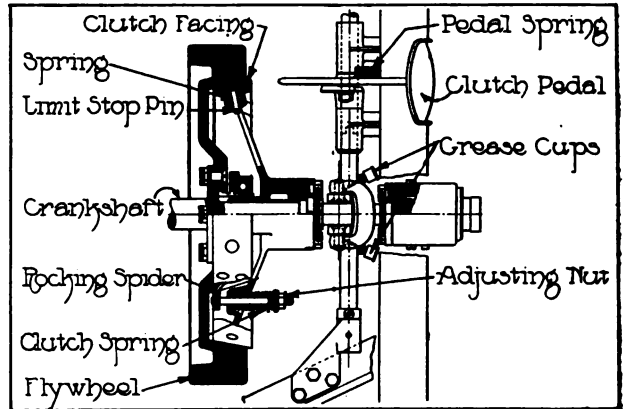


Fig. 5—Components of Leather Faced Cone Type of Clutch, Actuating and Adjusting Mechanism.

the pipe, and remove the carburetor. The manifold may now be displaced in the same manner as was the exhaust. The inlet water manifold m is now accessible and as it is retained by four bolts these can be taken out easily. To prevent injury to the fan o and to reach the timing gears this and the belt p are displaced by taking out the bolts n. The starting crank s having its bearing in the housing r, the bolts of the latter will have to be removed before the lower crankcase x can be separated from the upper member. By disconnecting the unions t and z the motor is ready for the removal of the cylinders.

#### Bearings, Etc.

Separate cylinders, those cast in pairs and triplets of the multitype should be marked to insure proper replacement before removal. This may be accomplished with a prick punch, and this tool will be found to be handy for other purposes. Individual cylinders may be removed easily by one person if careful, but pairs and triplet castings may require two, depending upon the strength and experience of the workman. Place the cylinders to one side for cleaning. Next remove the pan and drain the crankcase of old lubricant before removing the lower half. If the camshaft and crankshaft are to be removed, mark the bearing caps so that these will be replaced

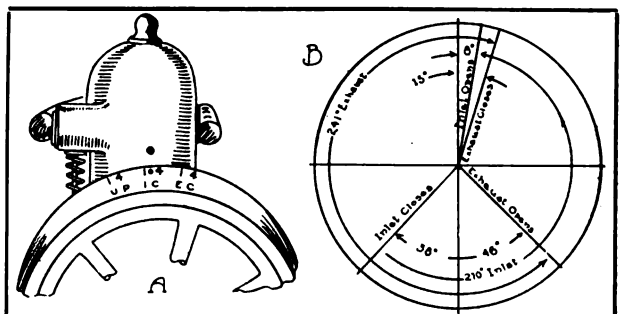


Fig. 6—Illustrating Utilization of Flywheel Marks and Timing Diagram for Resetting the Valves.



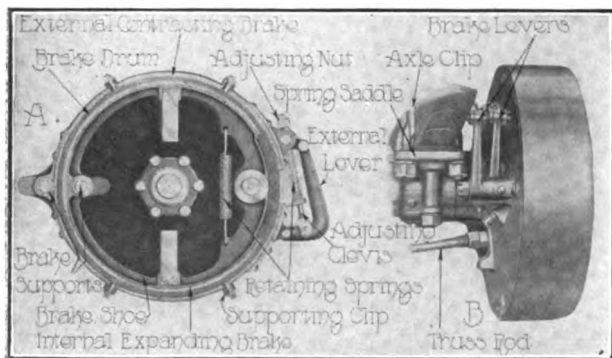


Fig. 7—Conventional Internal Expanding and External Contracting Brakes and Components Requiring Attention.

properly. Note if the timing gears and crankshaft gear are marked; that is, prick punched. This insures correct replacement. If not, mark one tooth of the driving gear and two teeth of the driven member between which the first named tooth meshes. The adjusting of bearings may be accomplished by removing one or more shims, or it is possible they will require scraping. This is best determined by the expert. The large and small ends of the connecting rod and the wristpins will require attention and the method of adjusting will depend to a certain extent upon the bearing material employed and the construction.

#### Removing Piston Rings.

The removal and replacement of piston rings may bother the novice. Being fragile the rings must be handled carefully. By slipping three strips of tin or hacksaw blades between the rings and piston, and at points equidistant, the top ring may be removed easily and the others in order. To replace, reverse the order. In cleaning the cylinders, plugs, valves, piston and rings, an old

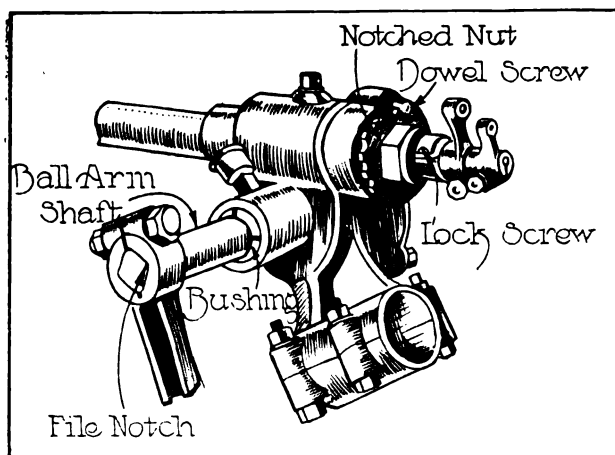


Fig. 8—Showing Parts Employed in Eliminating Back Lash of Steering Gear and Lost Motion.

knife may be employed to advantage. Smearing the parts with a mixture of graphite is recommended, as carbon will not stick as easily as to a rough surface.

With the cylinders on the bench or floor, it is an easy task to compress the valve springs, remove the retaining member and displace the valves. It is best to grind in the valves of one cylinder at a time. Do not take out all the valves at a time unless they are marked, as they are easily mixed. If not familiar with grinding, it is best to utilize a screw driver and a fine abrasive, which may be purchased or made. The finest of carborundum mixed with oil is a rapid cutter, but care should be exercised by the novice, and it is well to employ plenty of oil. Wash thoroughly with gasoline before assembling the valve mechanism.

#### Replacing the Cylinders.

Replacing the cylinders will bother the novice and it is advisable to have assistance. The rings must be so spaced that their slots do not register, and it will

be necessary to compress them before the cylinder can be slipped on. By using a clamp constructed of sheet metal, or winding the ring with stout string, the desired compression may be obtained and the cylinder slipped over the top ring, and the balance in order. Before replacing the cylinder lubricate well the rings, piston and cylinder walls. All bearings should receive similar attention. The writer obtains excellent results by smearing the valve caps, valve stems and tappets with a mixture of oil and graphite before replacing these members. The replacement of the exterior components is accomplished by reversing the alphabetical chart at Fig. 2.

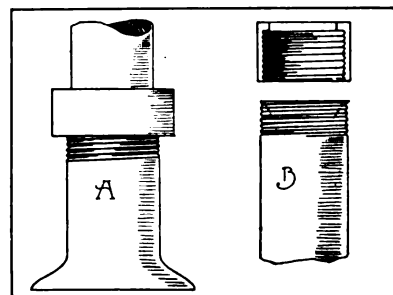


Fig. 9—Stuffing Box for Leaky Valve Tappets.

Before replacing the cylinder lubricate well the rings, piston and cylinder walls. All bearings should receive similar attention. The writer obtains excellent results by smearing the valve caps, valve stems and tappets with a mixture of oil and graphite before replacing these members. The replacement of the exterior components is accomplished by reversing the alphabetical chart at Fig. 2.

#### Lubricating System.

All components of the lubricating system should be thoroughly cleaned and special attention given to the screens or filters, as these are likely to be more or less clogged if the oil has not been strained. All unions and connections ought to be inspected as the cause of former leakage may be discovered. The lower crankcase will require a thorough washing with gasoline before replacement, and if a gasket is employed it

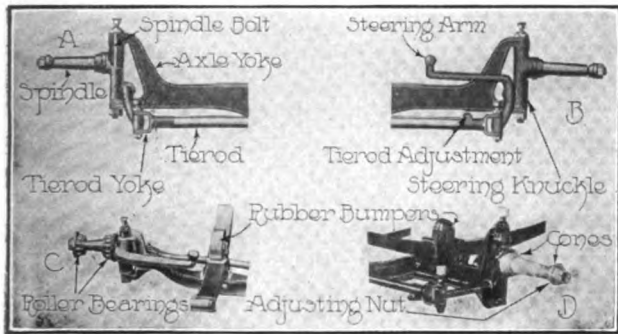


may be necessary to make or purchase a new one to insure an oil tight crankcase. In replacing gaskets, especially those employed with the intake and exhaust manifold, care must be taken to prevent leaks, for auxiliary air will affect the operation of the motor with the intake and cause a hissing noise with the exhaust. In setting up the nuts or stirrups retaining these pipes, tighten gradually, and make sure the manifolds are aligned. They may be tested, as can the fit of the spark plugs, by using oil or, better still, a solution of soap and water, as bubbles will be given off if the parts are not tight.

#### Timing the Motor.

If the gears are, or were, marked as previously explained, the timing or opening and closing of the valves will be a simple matter to check. The marks on the flywheel are generally utilized, and these are denoted by figures and letters, which may be as shown in the table herewith.

An arrow or indicator is generally provided,



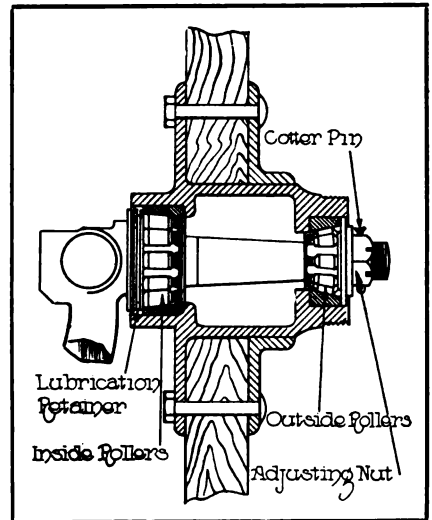
**Fig. 10—Components of the Steering Linkage Should Be Thoroughly Inspected and Lost Motion Eliminated.**

or the centre mark may be on the last cylinder, as shown at Fig. 6. To check the timing, rotate the flywheel until the mark I O 1 2, for example, coincides with the mark or arrow and the intake valve of the first cylinder (that nearest the radiator) begins to lift. It may be late or early, which can be determined by rocking the flywheel back

E O, exhaust valve opens.  
E C, exhaust valve closes.  
I O, intake valve opens.  
I C, intake valve closes.  
1, 2, 3, 4, 5 or 6, number of valve.  
C, centre.

or forth. If out of time, loosen the check or locking nut and screw the tappet in or out until the valve starts to lift with the marks coinciding as explained. If correct, rotate the flywheel until the mark I C appears and adjust the tappet if necessary. The exhaust valves are checked in a similar manner. If the camshaft has been removed and the gears are not marked for identi-

fication, the degrees will have to be marked off and the factory timing plan utilized. The camshaft is replaced so that the intake cam of the first cylinder starts to lift the tappet and valve, and in accordance with the timing plan. Instructions for timing the magneto and adjusting the carburetor are given elsewhere in this issue.



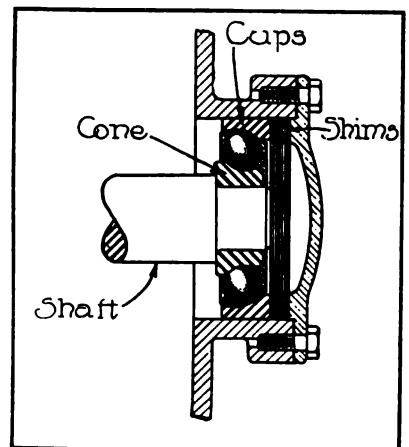
**Fig. 11—Adjusting Members of Roller Bearings.**

#### Clutch and Transmission.

With some types of power plants, dismantling the clutch is an easy matter, while with others more experience is required. With cone members it is essential that the spring be compressed and secured or allowed to expand fully. With the internal type, and after the spring is compressed, the clutch ring or female member can be removed and the spring gradually released. Those who have never taken down a clutch should treat the spring cautiously, especially if it be a strong one. With a multiple disc, flat plate or internal expanding clutch, a study of its construction will best determine how to proceed. Although the planetary type is not prevalent, a word will not be amiss. If fitted to the four-cylinder motor it is secured to the flywheel by bolts and nuts. On some types of two-cylinder cars it is attached to the engine shaft and will have to be removed with this member when dismantling the motor.

#### Types of Clutches.

A conventional type of cone clutch is shown at Fig. 5 with the components utilized in adjustment, etc., lettered. The multiple disc should be cleaned by washing the plates, etc., with kerosene, and if adjustment has failed to correct the trouble, the plates may be burred and need attention. The transmission requires the services of an expert, but the novice can remove all lubricant and inspect the gears, bearings, shifting forks, etc. If only slight adjustments are necessary, these may be made by observing the directions of the maker. If gear shifting troubles have been experienced, a thorough examination of the bearings, gears, etc., should reveal the cause of trouble. Sometimes, with the cone type of clutch, failure to effect a gear shift is due to the bearing being worn and allowing the cone to touch the flywheel. Shifting collars and all



**Fig. 12—Shimming Ball Bearings.**

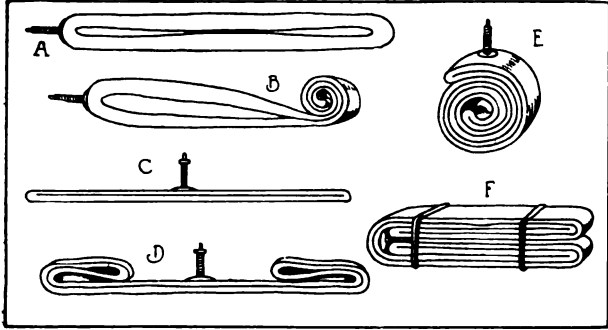






## CARE AND MAINTENANCE OF TIRES AND TUBES.

**E**VERY motorist desires to obtain at least the guaranteed mileage from his tires, but, despite the fact that the manufacturer conducts an



Illustrating Steps in Folding Inner Tubes for Carrying in the Car or for Storing.

educational campaign, many owners fail to secure maximum service because of lack of attention to the small details making for efficiency. It is important that the instructions of the maker be followed as carefully in the winter as in warm weather, because the casings are subjected to severe service when traversing over rough, frozen roads. Ice and snow invite more or less skidding, subjecting the walls of the shoe to sudden stresses, and moisture, a resultant of friction in cold weather, causes deterioration of the fabric if cuts are not vulcanized.

### Inspecting the Equipment.

The inspection of the tire equipment should be very thorough. By this is meant that each shoe ought to be removed from its rim, carefully examined inside and out, and all cuts vulcanized, as well as weak places backed up. The low cost of vulcanizers and their simplicity of operation has led many owners to perform this work, thereby effecting a considerable saving in tire upkeep expense.

Inner tubes should be overhauled, those with punctured walls repaired and any having faulty valves fitted with new. The tube bag or container should be cleaned and in repacking the tubes they should be sprinkled well with talc or soapstone. In an accompanying illustration are shown, in alphabetical order, the steps necessary in folding the tubes, the valve being removed during the operation depicted at A and B to permit displacing of the air.

### Cleaning the Rims.

Much of the trouble experienced in changing shoes is due to neglecting the rims. As it is not a pleasant task to change a shoe in freezing tem-

perature or in the snow, it is best to clean the rims and their components thoroughly, then coat the parts with a mixture of graphite and oil. Smooth all rough parts with a file if necessary, then use sandpaper or emery cloth to remove all deposits. Next, prepare the graphite, using the powder grade mixed with enough oil to give a consistency of paste. Smear the rims and their components liberally, then wipe off with a piece of waste. This will leave a glass like surface, filling all pores of the metal, and make the changing of tires a simple matter. Thomas' anti-rust paint, the base of which is graphite, may also be used. Either mixture will resist the action of moisture.

### Putting Tires Away.

If the car is not to be used, it is best to remove the tires, having all cuts repaired before cleaning them. Use a good grade of soap and warm water, washing the exterior carefully, and dry thoroughly before covering. Tire covers may be employed or the casings wrapped with paper, which may be obtained from any tire dealer. The object of covering the shoe is to prevent the air reaching the compound. In storing the casings they should be placed where the temperature is fairly even. It should not be too cold or too warm. Inner tubes can be stored in the tube bag or wrapped in paper.

### Use of Tire Chains.

If tire chains are employed they should be properly adjusted. If they are fitted too snugly



Casings to Be Stored Should Be Cleaned Before Wrapping to Remove Oil and Foreign Deposits.

the tread is apt to be damaged. They should have a certain amount of movement to obtain best results.



## WITH THE CYCLECAR MANUFACTURERS.

### American Cyclecar Company Makes Public Constructional Details Concerning Its New Trumbull Model--Still Another Design Announced from Detroit.

**F**OLLOWING the announcement that the American Cyclecar Company, originally formed in Detroit, had passed into the control of the Connecticut Electric Manufacturing Company, Bridgeport, Conn., and that the new vehicles would be produced in the latter city, those interested in the cyclecar branch of the industry have anxiously awaited detailed particulars of the machine itself. It is to be known as the Trumbull, and it is described briefly by its maker as a completely equipped four-wheel light car. Accompanying illustrations reveal the features of design and construction.

It will be noted that the body is designed

ter-cooled, en bloc, L head unit, with mechanically operated valves and with bore of 2.875 inches and stroke of four inches. This gives a rating of 13.25 horsepower under the S. A. E. formula, and the maker's rating is 14-18 at nominal speed. Lubrication is by pump and splash. Ignition is by Unisparker with automatic spark advance, current being supplied from a storage battery.

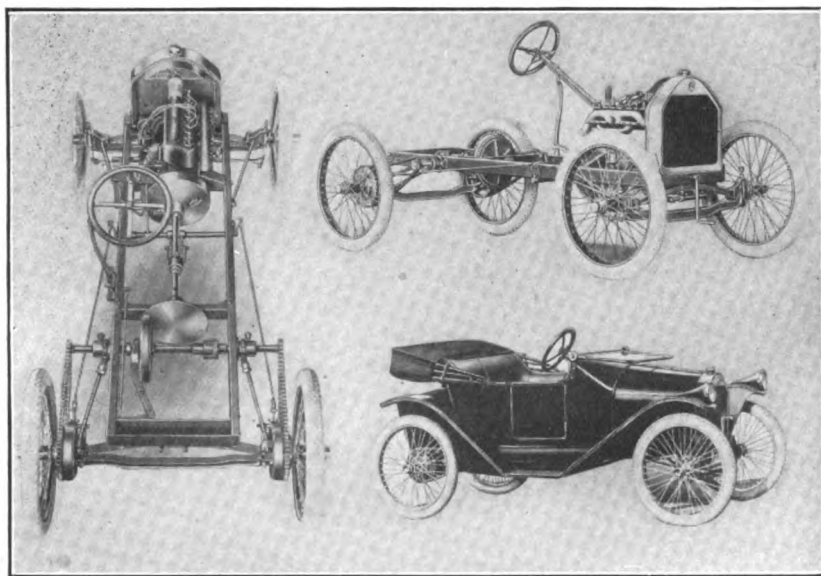
Power is transmitted through a propeller shaft to a friction disc located under the seat. The driven friction wheel is carried on a jackshaft, fitted with sprockets carrying roller chains which deliver the power to the rear wheels. Four speeds forward and reverse are provided, as is customary with cyclecar practise in this country, the several speeds being controlled by the one hand lever at the left.

Standard contracting friction brakes operate on the rear wheel drums, these being actuated by pedal, and the friction transmission may be utilized as an emergency brake. Springs are of specially heat treated steel, transverse semi-elliptic both front and rear. The axles are of special forged steel and dropped steel forgings are used for the knuckles and steering arms. The frame is of pressed steel, channel section.

Wheels are of wire, special design and quick demountable. They are equipped with 28 by three-inch clincher tires, and any wheel will fit all hubs,

front and rear, and on either side. When an extra member is supplied, this is carried on the left running board. The hubs are of special pressed steel, and the wheel may be removed without disturbing the bearings. Patents are pending on the design throughout.

The electric lights at the front are carried at the forward end of the fenders, and are provided with a special arrangement for dimming, this being controlled by a switch from the seat. The rear lamp also is electrically lighted. The mechanical motor starter is operated from the seat. The electric horn is operated from the storage

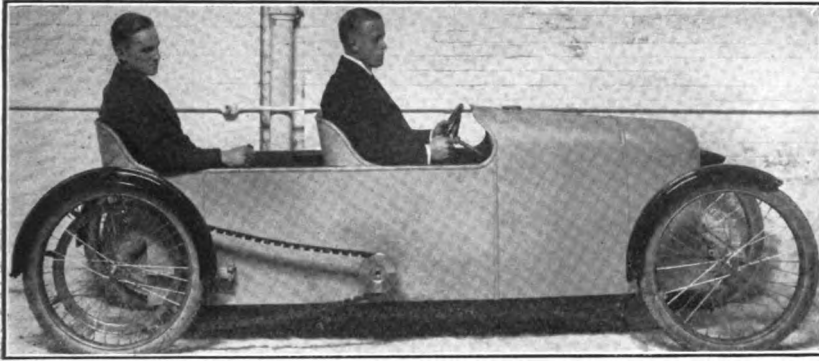


**Plan and Side Views of Trumbull Cyclecar Chassis, Also General View of the Completed Vehicle.**

along Continental automobile lines, and seats two passengers side by side, the driver being located at the left with the one hand lever conveniently placed at his left. The wheelbase is 80 inches and the tread 44. The weight is approximately 650 pounds. The car comes completely equipped with top, side curtains, windshield, electric lights, motor starter, electric horn, oil gauge, jack, tire pump and tool kit. At a slight additional cost a spare wheel with hub cap and tire, 60-mile speedometer and dash automobile clock are supplied as well.

The motor is a four-cylinder, four-cycle, wa-





**Mercury Cyclecar with Engineer C. E. Barton at the Wheel and His Assistant, H. J. Woodall, as Passenger.**

battery. The speed of the car is given as 45 miles an hour and the fuel consumption, 35 miles to the gallon.

### MERCURY FROM DETROIT.

The Mercury Cyclecar Company, Detroit, reports that it has leased the factory formerly occupied by the Tribune Motor Car Company, at 807-815 Scotten avenue, and that contracts are being let for material which will permit the construction of 3000 Mercury cyclecars during the 1914 season. It is stated that experimentation has continued throughout a long period and that the new machine is offered as a thoroughly practical vehicle in every respect.

Accompanying illustrations reveal the general appearance of the car, and it will be noted that the two passengers are seated tandem. The body lines are distinctly new, as applying to American cyclecar design. The wheelbase is 100 inches and the tread 36. The weight is not given in the preliminary announcement.

The motor is a DeLuxe, twin-cylinder, air-cooled V type unit, with bore and stroke of 3.5 inches, rated by the maker at 9.8 horsepower. The cylinders are cast singly and the piston displacement is 70.1 cubic inches. This is located crosswise of the chassis under the hood. Ignition is by Bosch magneto, carburetion by a Schebler, and lubrication by splash with gravity feed.

Power is transmitted by shaft and friction disc to a friction wheel on the countershaft under the driver's seat, from which point it is conveyed to the rear wheels by two V belts. Underslung springs are utilized

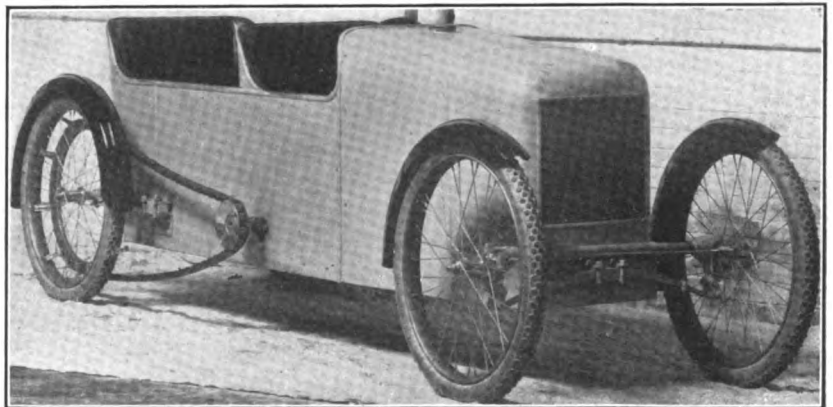
both front and rear, the former being transverse semi-elliptic and the latter of the cantilever type. Crowned fenders are provided on both the front and rear wheels, these being attached to the wheel hubs instead of the body. The wheels are of wire with ball bearing hubs. Tires are 28 by 2.5 inches, with non-skid tread.

The body is of metal, with wood frame, and the equipment includes three lamps, tire tools, pump and tire kit. The gasoline tank, with capacity of five gallons, is carried in the cowl of the dash.

The Mercury Cycle Car Company has been incorporated under the laws of Michigan with a capitalization of \$50,000. The following are the proposed officers: President, W. J. Marshall; vice president, R. C. Albertus; secretary, C. E. Barton; director, H. J. Woodall.

Sales Manager Redden of the Maxwell Motor Company, Detroit, is unable to foresee any difficulty in placing the product of that concern during the 1914 season. He returned from a trip throughout the Middle West recently, the main object of which was to satisfy the dealers in that section without materially changing the production plans of the company.

His first stop was in Minneapolis, where he supervised the equitable distribution of a train load of Maxwell cars consigned to the dealers in the Northwest. He declares that every man in the party wanted twice as many machines as the company was prepared to deliver to them, and the same conditions are reported elsewhere.



**Three-Quarter View of the Mercury Cyclecar, Presenting Front Spring Suspension, Etc.**



## CONTROLLING GAS LIGHTING.

THE convenience of controlling the lights from the seat is appreciated by motorists. Not only is considerable time saved when it is

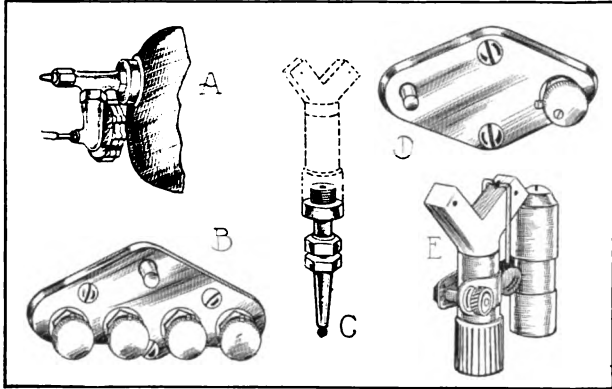


Fig. 1—Components of Prest-O-Liter, Gas Lighting System Controlled from the Seat: A, Automatic Reducing Valve, Maintaining Proper Pressure; B and D, Controller for Headlights and Five Lamps; C, Adapter for Converting Oil into Gas Units; E, Insulated Burner.

possible to light and extinguish the lamps by pressing a button, etc., but when the control of the groups includes a dimming device, economy is effected.

The Prest-O-Lite Company, Inc., Indianapolis, Ind., is manufacturing a lighting system that fulfills the above requirements and a feature is that it may be installed by the owner at a moderate cost. With this system the headlights can be lighted, extinguished, dimmed, etc., from the seat by simply turning a knurled knob and pressing a button on the controller member, which is compact and located on the dash. One of the advantages of the equipment is that the different groups of lights may be used as desired; for example, the head and tail for country driving, and the side and tail for city work.

### Components of System.

The Prest-O-Lite equipment is made in three styles, the No. 2 being for the headlights only, the No. 3 for the head and tail lamps, and the No. 5 for all lamps. The equipment is very complete, including as it does the controller, vibrating coil, automatic reducing valve, burners, seamless brass tubing, insulated wire, lamp cord, rubber hose and unions for connecting the tubing. The length of the tubing, wire and cord varies according to the number of lights utilized.

The reducing valve, Fig. 1, automatically reduces the pressure of the gas in the Prest-O-Lite tank to two ounces. It is fitted as shown, requires no attention after being attached, and in-

sures the flame being at the proper height regardless of whether the tank is full or nearly empty. This saves walking to and from the lamps after lighting, and the gas valve may be opened as many turns as desired without affecting the pressure at the burners.

### Operation of Controller.

The controller, which comprises a push button and distributing valve, is mounted on the dash or in any other convenient place. It is made in three styles, that shown at Fig. 1 D, being for headlights only, while that depicted at B is for controlling the head, side and tail members. It is also made for head and tail.

The operation of the controller is very simple. When use of the lights is desired the valve is turned and the button pressed. This causes a spark to occur at the burner, igniting the gas. The headlights may be dimmed by a slight turn of the controller to a notch provided for that purpose. With this arrangement, the headlights may be used in cities where the ordinances prohibit the use of glaring headlights. The side lamps could be dispensed with.

### Lighting Device.

The lighting device is shown at Fig. 1 E. It consists of an insulated burner tip, to which is connected a lead from dry cells and the usual ignition battery may be utilized if desired. The system is simple and practical, being similar to that for house gas lighting, which has been in vogue for years. The low-tension current of the cells is intensified by a small vibrating coil.

When the side and tail lamps are to be converted into gas units, an adapter is supplied, this

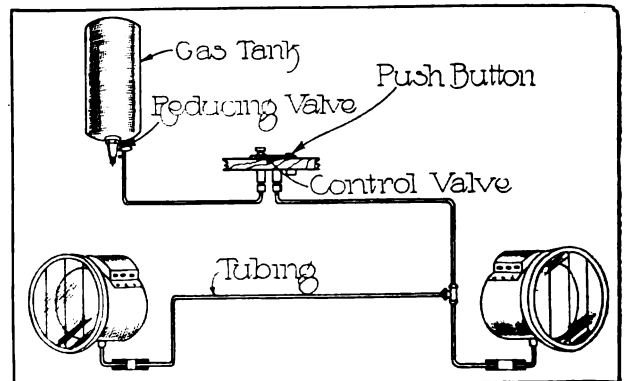


Fig. 2—Showing Simplicity of Installation, Method of Piping and Location of Controller.

being shown at Fig. 1 C. A small hole is drilled in the side of the lamp and the adapter inserted and locked by nuts. The work may be accom-



plished without difficulty by the owner.

The simplicity of the installation is shown at Fig. 2, which depicts the Prest-O-Liter for head-

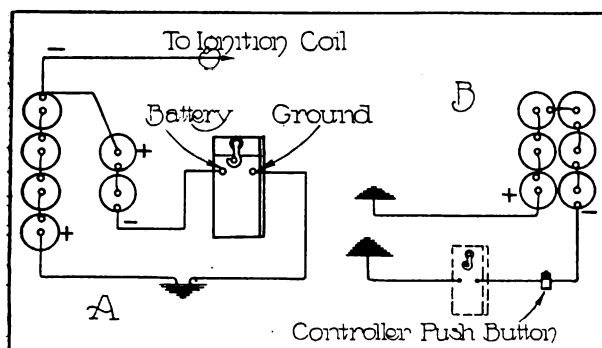


Fig. 3—Wiring Plan of Prest-O-Liter System: A, Diagram for Adding Two Cells to Four-Cell Ignition; B, Primary Side of Spark Coil.

lights only. One tube is led from the reducing valve to the controller, thence from another connection to the lights. When the car is piped for the headlights it would only be necessary to pipe to the controller and to the main line.

#### Wiring Plans.

The wiring plans are shown at Fig. 3. That at A is a diagram for adding two cells to the ordinary four-cell ignition system, and it will be noted that the wiring is in series and that two grounds are made, the usual from the four cells and the second from the coil. The positive of the larger set is connected to the ignition coil and the negative to ground, and the positive of the auxiliary cells to the negative of the other set. The diagram at B depicts the primary side of the spark coil with six cells employed and with the push button of the controller in circuit. The wiring plan of the secondary circuit with a group of five lights is shown at Fig. 4, and it will be observed that it is very simple.

#### Burners.

The Prest-O-Lite Company recommends the use of .125-foot burners for the side and tail lights and gives option of different sizes for the headlights. The equipment comes complete with detailed instructions for installation and the different styles are carried in stock at the numerous branches maintained by the company.

### THE LINCOLN HIGHWAY.

#### Decided Activity Indicates Enthusiastic Support of the Project.

The Lincoln Highway Association, Detroit, reports that special celebrations were held in over 2000 cities, towns and villages along the pro-

posed route of the Lincoln memorial highway between New York and San Francisco, Oct. 31, the date selected for the formal ratification and dedication of the plan. It is also stated that the proposition was brought directly to the attention of the people by several hundred clergymen during sermons on the life of Abraham Lincoln, Nov. 2.

Special effort has been directed toward increasing the amount of subscriptions to the fund of \$10,000,000, held to be needed for the proper construction of the cement highway, in several sections of the country, and contributions are being received from many sources well removed from the actual route selected. Among these latter may be mentioned one from A. H. Stanley, managing director of the London General Omnibus Company, Ltd., London, England. It is proper to state, in this connection, that Mr. Stanley formerly was a resident of Detroit and served on the U. S. S. Yosemite during the Spanish-American war.

One result of the dedicatory celebrations is that a large proportion of the route has been marked by the official copyrighted marker of the association, which comprises a strip of red three inches wide, a band of white 16 inches wide and a strip of blue three inches wide. On the white band is a large letter L with the word Lincoln above and Highway below.

The Stewart-Warner Speedometer Corporation, Chicago, announces the establishment of nine new direct factory branches, in charge of the company's own district sales managers and a corps of expert, factory trained mechanics, for Stewart and Warner speedometers, in the follow-

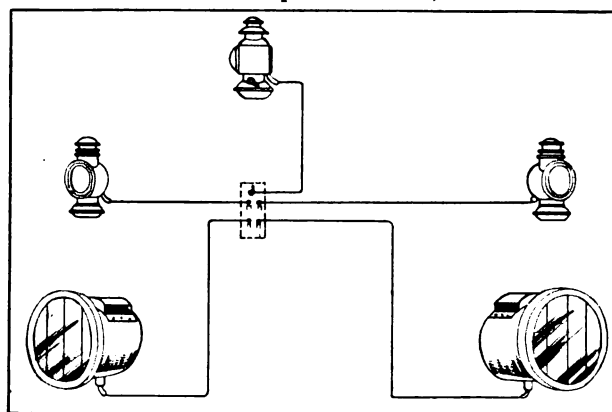


Fig. 4—Wiring Plan of Secondary Side of Prest-O-Liter System, Showing Connections of Coil and Leads to Lamps.

ing cities: Philadelphia, Pittsburg, Atlanta, Portland, Los Angeles, Kansas City, Minneapolis, Cincinnati and St. Paul.



## STARTING MOTORS WHEN COLD.

### Systems Supplying Additional Fuel Direct to the Cylinders or Increasing Carburetion from Exhaust or by Electric Current.

**E**LECTRIC, mechanical and compressed air types of motor starters have not wholly solved the starting problem in cold weather, for under certain conditions, extreme low temperatures for example, the mixture must be enriched to obtain the explosions necessary to warm the cylinders. While it is possible to augment the fuel supply or decrease the air with the modern carburetor, and from the seat, accessory makers have brought out a number of devices for this work and particularly adapted to motors not fitted with priming attachments, etc. The majority provide means for introducing fuel into the intake pipe, either plain gasoline or a vapor; others vaporize the liquid by electricity or hot air, and some combine both priming and fuel saving features. In the majority of installations the control unit is mounted on the dash, convenient to the operator.

#### Ideal.

The Ideal, manufactured by the Auto Accessory Company, 2124 East Washington street, Indianapolis, Ind., is a primer, the container being located on the dash and having a petcock and plunger. The last named is utilized for forcing the fuel to the intake manifold and for breaking it up into a spray. To use, the petcock is opened, allowing the fuel to flow through a tube, and the plunger employed as stated.

#### Gilson.

The Gilson, made by the Gilson Motor Starting Company, 1409 North Illinois street, Indianapolis, Ind., is a primer and fuel saver, comprising a fuel container mounted on the driver's side of the dash and having a controlling handle. The

priming fuel is fed by gravity to the intake pipe through a tubing and is vaporized by the heat, another pipe being coiled about the exhaust manifold. The suction of the piston draws the hot air directly into the intake manifold, the heat not only augmenting the flammability of the mixture, but converting into vapor any particles of raw fuel. The dash vessel holds sufficient fuel to make a large number of starts, and control of the priming fluid is by a needle valve.

#### Nelson.

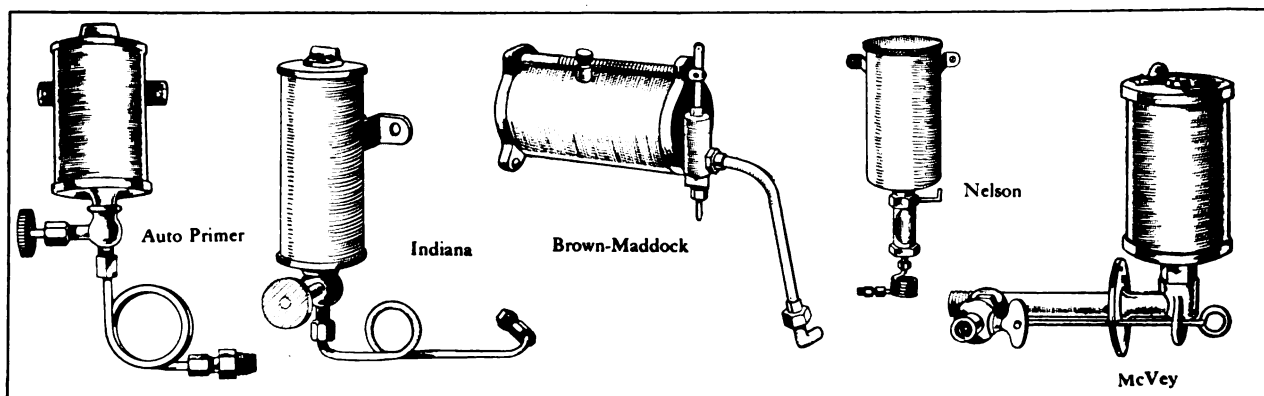
The A. Nelson Manufacturing Company, Chicago, is marketing a primer which is of the dash type, but differs from those described in that a sight feed device is incorporated, enabling the operator to note the amount of priming fluid fed to the intake pipe. Control of the supply is provided and the equipment includes tubing, etc.

#### Indiana.

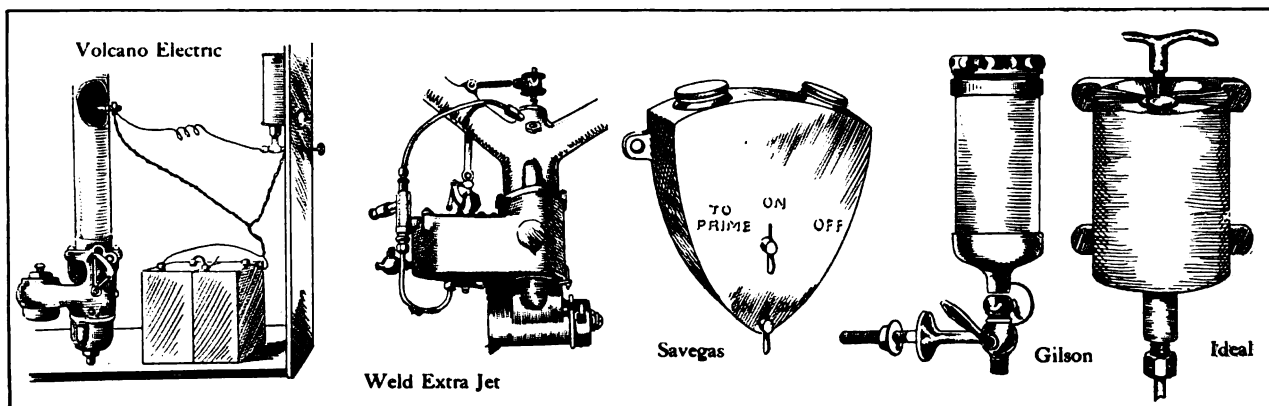
The Indiana primer, manufactured by the Indiana Equipment Company, 1201 State Life building, Indianapolis, Ind., comprises a nickel plated half-pint reservoir for mounting on the dash, suitable length of tubing and connection for the intake manifold. A needle valve is provided to control or regulate the mixture obtained with the primer, and the maker states it can be installed in 15 minutes.

#### Brown-Maddock.

The Brown-Maddock starter is the product of the Brown-Maddock Company, West Newbury, Mass., and varies from the usual intake pipe primer in that it is operated from the front of the car, much in the same manner as the carburetor is flooded by depressing the float. The







primer and container are mounted as a unit on the dash under the hood, and actuating the connection primes the intake pipe. Lack of space prevents giving other than an outline of the starter.

#### Auto Dashboard Primer.

The Auto dashboard primer marketed by the Ideal Brass Works, Indianapolis, Ind., is six inches high, weighs one pound and comes with 26 inches of .125-inch copper tubing and connections. The device is mounted on the dash and the flow of fluid to the intake pipe is regulated by a needle valve. It comes in nickel, polished brass or gun metal finish.

#### Savegas.

The Savegas, marketed by the Housel Manufacturing Company, 207 Livingston building, Rochester, N. Y., is made in two models. That illustrated is the model A and comprises two separate chambers, one for storing a priming fluid and the other a decarbonizer. In addition to its priming feature it is claimed that it will save 15 per cent. of the fuel and that starting is made easy in cold weather.

#### McVey Start-O-Speed.

The Start-O-Speed, produced by the McVey Manufacturing Company, 16 Canal street, Dayton, O., utilizes the exhaust for forcing the fuel to the intake pipe. The priming fluid is controlled by a lever member which is connected to the hot air cock and after the initial explosion the heat vaporizes the fuel, and a rich mixture is fed to the cylinders until they become warm. The device is provided with a charge indicator, a gasoline chamber and a reserve charge compartment.

#### Volcano.

The Volcano, made by the Volcano Electric Primer Works, Virginia, Ill., not only feeds the fuel to the intake pipe above the carburetor, but vaporizes the fluid by electricity. The font containing the priming material is located under the hood, and the valve member, incorporated with

the container, extends through the dash to the driver's side. The construction of the primer is such that one teaspoonful will supply a mixture sufficient to turn the motor over 150 times, it is claimed, and the font is said to have a capacity of 150 primings. The pressing of the valve button permits the proper amount of fuel to pass to a plate in the intake member, where it is vaporized by the heat of the current supplied by dry cells or a storage battery. Control of the current is by a special switch. The maker points out that it is a simple matter to repeat the primings in very low temperatures until the motor is warm.

#### Weld Extra Jet.

The Weld extra jet was illustrated and described in detail in the Oct. 10 issue of The Automobile Journal. The priming operation is consummated from the seat and differs from the usual methods, in that the fuel is taken from the float chamber of the carburetor, mixed with air, and supplied to intake pipe in proximity to the cylinders. The size of the jet is approximately .75 by 3.5 inches, and connection from it to the control member is by a small brass chain. It can be attached without soldering, only two small holes being required for an .125-inch pipe. In addition to making for easy starting it is pointed out that the adjustment of the carburetor will not require changing to enrich the mixture.

A meeting was held in the Hotel Ten Eyck, Albany, N. Y., Nov. 20, for the purpose of organizing the New York State Automobile Dealers' Association. Representatives were present from a large number of the local dealers' associations in the state. The objects of the new association include the preparation and introduction of bills for the better protection of motorists, and to assist in any way possible to establish good roads, etc.



# ADJUSTING AND TIMING THE MAGNETO.

MANY owners who are capable of overhauling the power plant hesitate to disturb the magneto, regarding the construction and operation of the instrument as mysterious and requiring the services of an expert. It is a simple matter to clean, adjust and retim after displacement from the

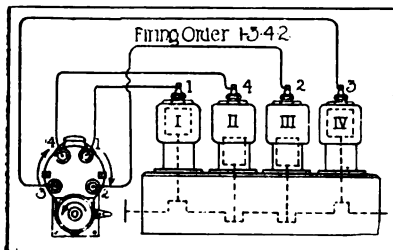


Fig. 1—Wiring Diagram of Four-Cylinder Magneto.

motor, and if the car has been in service for some time, it is advisable to give the magneto attention. For the benefit of those not familiar with the work, the accompanying illustrations and suggestions will be of value:

## Components of Breaker Box.

One of the most important components of a magneto is the breaker box, the mechanism of which interrupts the primary current, and in this connection it should be stated that with the majority of instruments the mechanism serves for both the magneto and battery current. As the spark is supposed to occur at the same instant the break takes place it is obvious that faulty operation of the parts will result in inefficiency in that the spark will be too late, making starting difficult, or it will not completely burn the charge in the cylinders.

Conventional circuit breaker mechanism is shown at Figs. 2 and 3, the latter presenting that utilized with a Bosch Instrument. The cover is removed by pushing the spring member to one side as indicated in the drawing. With this type of magneto the circuit breaking mechanism is secured to the armature shaft revolving with it. The break is obtained by two platinum points, one a fixed member, the other secured to a pivotally mounted lever. At one end of the lever will be noted a fibre block member, upon coming in contact with the steel segments, depresses the lever, causing the movable platinum point to separate from the fixed point.

The breaker box of the Splittorf shown at Fig. 2 differs in that the breaker mechanism is practically fixed, being secured to the breaker box proper. The principle is similar to the one just explained, differing in that a cam secured to the armature shaft lifts the lever or bar carrying the movable platinum point. The Remy also employs a cam for separating the contact points, but the

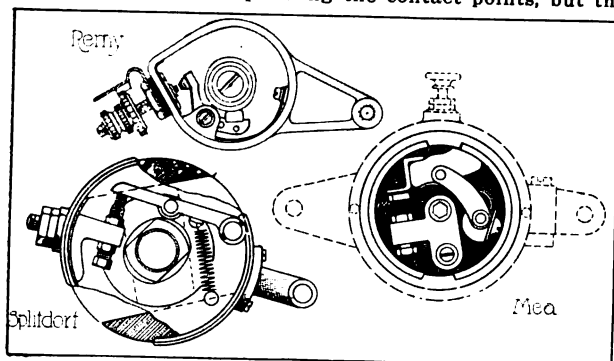


Fig. 2—Components of Breaker Boxes of Conventional Magneton, Showing Contact Points and Adjusting Mechanism.

arrangement of the components differs, as will be noted by a little study of the drawing. The Mea breaker box, also shown at Fig. 2, employs a fibre roller and cams for breaking the low-tension current generated by the instrument.

## Adjusting Break of Points.

With these types of magnetos, and with many others, provision is made for the adjustment of the break; that is, for setting the gap between the points. Usually the fixed point is set, the screw carrying it having a hexagonal head and locking nut. Loosening the latter with the wrench provided by the maker will permit of decreasing or increasing the break as may be necessary. The break varies, according to the instrument, but the correct space may be obtained by using the wrench, one end of which is calibrated for this work.

The points may be pitted, burned or contact unevenly through careless adjustment. When these conditions exist considerable resistance to the passage of the current is set up and the points should be smoothed with a very fine jeweller's file, taking care not to remove too much of the metal. Make sure that the points meet squarely. Upon completing the work, clean the breaker box, but lubricate only in accordance with the instructions of the maker. Where fibre is employed oil should not be utilized.

The components of the distributor are accessible

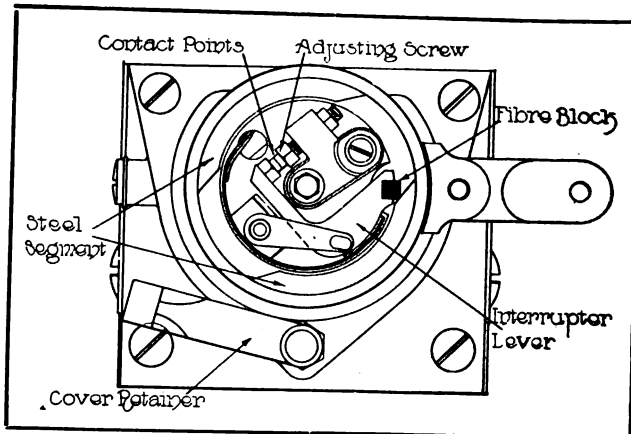


Fig. 3—Bosch Breaker Box Mechanism with Parts Lettered to Illustrate Operation.

through removing a cover or plate, according to the design of the magneto. The function of the distributor is to connect the high-tension current with the wires leading to the spark plug, when the charge should be fired. The operation is simple, an arm rotating at half engine speed making contact by means of brushes, etc., with the segment to which is attached the wire leading to a spark plug. There is little to be done with the distributor, other than cleaning it with a soft brush, displacing any foreign elements. It should not be lubricated.

## Timing Magneto.

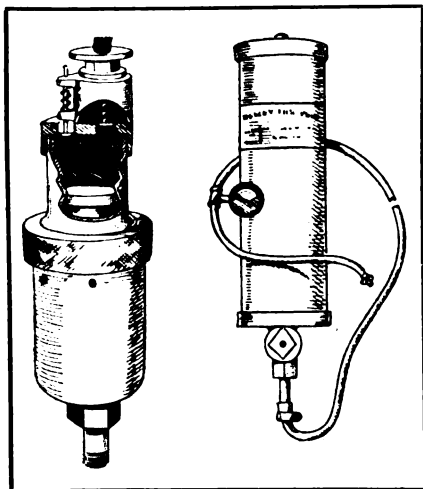
If the magneto be removed in the overhaul and the gears, coupling or shaft not marked, it will be necessary to retim the instrument. With a four-cylinder motor, for example: Have the piston of the No. 1 on compression (top centre), rotate the armature shaft until the points start to break, then mesh the gears or secure the coupling. Without moving the armature, note the position of the distributor arm. The segment with which it makes contact or to which it is opposite is that which should be wired to the first cylinder. The wiring plan is shown at Fig. 1 with the firing order of the motor 1, 3, 4, 2. It will be noted that the armature shaft rotates clockwise (looking at the driving end) and that the distributor arm moves in the opposite direction. By observing the direction of rotation of the armature and distributor, and connecting the leads according to the firing order of the motor, no trouble should be experienced in retiming the magneto.



## ADVANTAGES OF POWER TIRE PUMPS.

**P**OWER tire pumps not only save considerable labor, but are good tire insurance, in that it is a simple matter to keep the shoes inflated properly, a precaution often neglected because of the work involved with the usual hand pump. The car manufacturer now recognizes the importance of the power pump and several makers are fitting it as standard equipment with the 1914 models.

These pumps are generally constructed in two forms, those fitted permanently to the motor and the removable type. The latter are moderately priced; are as efficient as the permanent members and the majority of makes are so compact that they occupy but little room in the tool box. They are constructed so as to be screwed into



National at Left, Dewey at Right.

the spark plug opening, secured by special connections, or come equipped with a special type of plug permitting of quick insertion.

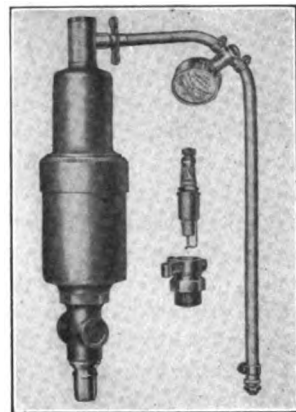
The National, made by the National Motor Supply Company, Cleveland,

O., is utilized by screwing it into the spark plug opening, and comes complete with 12 feet of high grade rubber cloth tubing, pressure gauge and connections. It has patented leak proof piston and rings, pure air being drawn into the cylinder through an intake port. An outlet valve opens at the proper instant, permitting the compressed air to flow gradually through the tubing, etc., to the tire. The pump is highly polished and nickel plated, is constructed to fit any spark plug opening and weighs but five pounds.

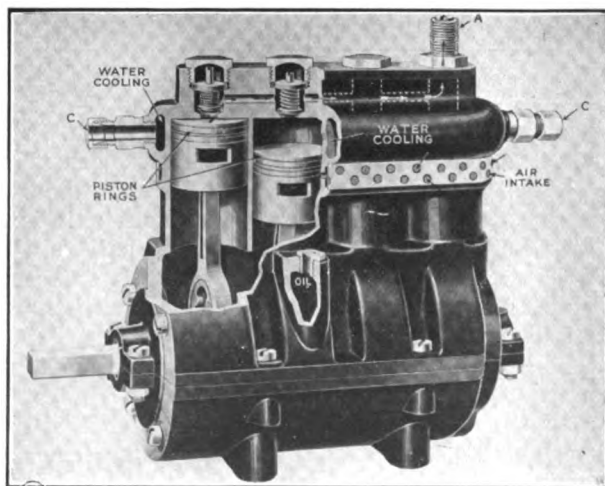
The Dewey, made by the Dewey-Anderson Company, Toledo, O., is a very light and compact pump, 12 inches in length, and may be installed permanently or carried in the tool box. When fitted to the motor, a special connection made by the company is utilized, several methods of installation being available. The Dewey

is accurately made, does not require lubrication, and efficiency at low motor speeds is emphasized by the maker. Ample length of woven cloth covered hose, pressure gauge and special connections are supplied with each equipment.

The Brown Impulse tire pump, manufactured by the Brown Company, Syracuse, N. Y., like those previously described, is operated by the compression of the motor. It is made like a motor, with two cast iron pistons and rings, and a connecting rod of high grade steel between the larger piston, on which the compression acts, and the smaller one which forces the air to the tire. The early types were constructed to be screwed into the spark plug opening or to be permanently attached, but the company is now marketing the pump with a special connection and a quick detachable spark plug as shown in the accompanying illustration. Owners of the early models may obtain this connection and the fittings for a small sum. With the new equipment it is possible to remove the spark plug core and insert the pump quickly and easily, the operation involving a slight turning movement of the pump after insertion in the opening. The Brown comes with ample length of tubing, gauge and connections.



Brown Impulse and New Connections.



Stewart Four-Cylinder, Made in Two Models.



## IN THE COMMERCIAL VEHICLE FIELD.

### General Vehicle Company Announces a 1000-Pound Delivery Wagon Chassis with Worm Drive--United States Government Studying Mine Rescue Work.

THE latest model of the well known G. V. electric line, produced by the General Vehicle Company, Long Island City, N. Y., is a 1000-pound worm driven wagon that differs materially in appearance from anything the company has previously manufactured. Instead of being suspended in a cradle under the body, the battery is installed in front under a sloping hood.

The wagon is driven by a General Electric series wound motor, and the power is transmitted by a shaft with a universal joint at either end, to the worm and worm wheel in the steel rear axle housing. The worm shaft is steel and the wheel, with which is assembled the differential, of

way running switch is under the seat, and the handle of the controller can be removed only when it is in neutral position. Extreme provision is made to protect the machine against interference when left unattended.

#### SAVING THE CITY'S MONEY.

#### Detroit Police Department Purchases Commerce Wagon in Interests of Economy.

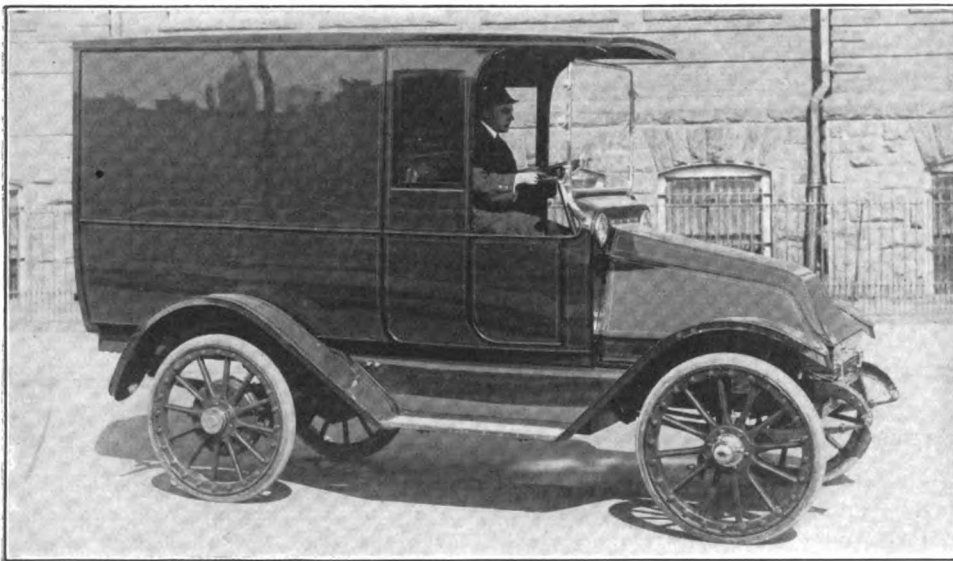
The police department in Detroit has a number of patrol wagons which cost the city in the neighborhood of \$5000 each. Until recently it

was the custom of the precinct officers to send these machines to headquarters twice a day with the reports and any property that might have been taken from prisoners upon arrest. This mileage, when added to that covered in making arrests, brought the total for 1911 to 80,000 and for 1912 to 115,000.

The attention of the police commissioner was directed to this matter one day, when a policeman stepped from

one of these \$5000 automobile patrols into his office for a pad of report blanks for a precinct some distance out. The patrol carried its usual equipment, driver and two officers. The commissioner also took into consideration the fact that when the big car was thus engaged it was absent from duty at the precinct station for which it had been purchased.

The result of this incident was a reorganization of the police patrol system. A 1000-pound Commerce wagon, made by the Commerce Motor Car Company, Detroit, was selected for the errand work. This smaller car, which is presented in an accompanying illustration, is manned by



**New 1000-Pound, Worm Driven G. V. Electric Wagon Fitted with Panel Body.**

bronze. The differential assembly and the wheels are mounted on Timken roller bearings.

The frame is a pressed steel channel, mounted on semi-elliptic springs. The front axle is a drop forged I section, and the rear axle of the full floating type. The service brake is operated within and the emergency brake without drums bolted to the rear wheels.

The battery and motor will give 45 to 65 miles on a single charge at a speed of 12 miles an hour, and 40 to 50 at 15. The controller is of the continuous torque type, affording four forward speeds and two in reverse. This is installed in a metal box under the driver's seat. The three-





**Commerce 1000-Pound Chassis, Fitted with Police Patrol Body for Department in Detroit.**

one policeman, who acts as driver, and it is maintained that it will be but a short time before it has saved its purchase price, in reduced wear and tear on the larger machines, and in time wasted by salaried policemen.

### **SPECIAL RESCUE WAGON.**

#### **United States Bureau of Mines Stations White Vehicle at Pittsburg, Penn.**

For some time past the government of Great Britain has made it compulsory to have installed in mining centres motor vehicles equipped with special life saving apparatus. So far as is known the first attempt to follow this example on the part of the United States government is the installation of a specially designed vehicle at Pittsburg, Penn. The car utilizes a White chassis, made by the White Company, Cleveland, O., and is under the jurisdiction of the United States Bureau of Mines.

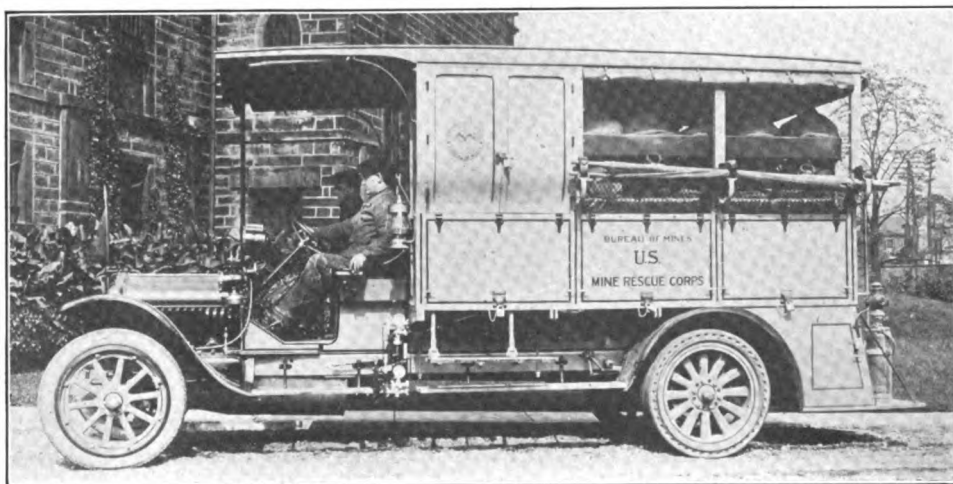
As will be noted from the accompanying illustration, the body has been designed with extreme care, and it was built to specifications supplied by the government. Beneath the driver's seat are two Draeger reviving outfits, and under the body on a sub-frame are six oxygen tanks,

stored transversely of the frame so as to be withdrawn readily. The oxygen pump is at the left side of the chassis and is driven by the motor. At the back of the seat is a five-foot crowbar and tent poles.

At either side of the body are compartments opened from the outside, in which are carried a tent, 22 feet of rope, three miner's picks, three miner's shovels, a four-pound sledge and two axes. Between these are two longitudinal seats with folding lazybacks, protected by a brass rail. Beneath the seats are compartments and there is another under the rear steps with side and end doors. There are also shallow drawers that contain saws, hose couplings, reducers, spanners and 200 feet of half-inch rope. In central compartments at the side are a lifeline reel, a telephone system, compasses, bits, braces, chisels, hacksaws and blades, snatch blocks, etc. Suspended outside of the body are two stretchers, fire extinguishers, lanterns, axes and other tools. On the running boards are two special boxes that contain mine lanterns, and in addition the equipment includes a pump, first aid boxes, 50 regenerators, two pulmotors, a box of explosives, a full telephone outfit and even a caged bird, the last mentioned being taken into mines to detect the presence of poisonous gases.

It will be noted that the machine carries everything that might be used in entering a mine where there is fire or gas, and that when necessary a field hospital can be extemporized.

The machine is intended as a demonstration of what is desirable in this respect, and the Bureau of Mines proposes that mine owners shall establish stations at suitable points and provide them with equipment of a similar description.



**White Chassis with Specially Equipped Body for Mine Rescue Work.**





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## THE OUTLOOK FOR 1914.

It will not be denied that New England represents that section which is regarded as most conservative in its business dealings. It ought also to be conceded that the automobile dealers in Boston are in a position to judge the conditions of the market in this part of the country.

The dealers and branch managers in Boston, as is set forth in greater detail elsewhere in this issue, are uniform in the opinion that the opportunities for satisfactory business during the 1914 season are quite as bright as at any time in the history of the industry. There is ample reason for believing that this can be taken as fairly representative of the situation elsewhere.

Conditions undoubtedly have changed since the earlier days, when the demand so far ex-

ceeded the supply that the public was eager to make substantial deposits in order to insure priority in deliveries. But the automobile has become a practical institution with an economic value that is still only partially realized. The stability of the industry is assured, and the present consistent demand on the part of prospective new owners has created a healthful business policy that can produce no other result than permanency.

## FAILURE OF SPEED TRAPS.

Slowly but surely those upon whom devolves the duty of enforcing traffic regulations are beginning to realize the impotency of the speed trap, so-called. Chairman Luther of the police commission in Providence, R. I., in announcing the abolition of this system in that city, explains the decision of the board in terms exactly parallel with the opinions of those who have given this matter careful study elsewhere.

Motorists who appreciate the importance of extreme care at all times—and these comprise a large majority of automobile owners and users—have always maintained that the speed trap catches only the more careful drivers. The reckless operator has little regard for others, and either quickly detects the trap and avoids it altogether or rushes through it at a speed so fast that the officers are usually powerless to act.

Automobile owners and users are deeply interested in this subject. The reckless driver is an even greater menace to the occupants of other cars than to pedestrians, if this be possible. The objection to the speed trap has been due not so much to the fact that it is felt that it has been the means of inflicting punishment upon those who were only technically guilty of violating the law, but because it is the honest belief of those who have the best interests of the public at heart that it does not, and cannot, reach the real offenders.

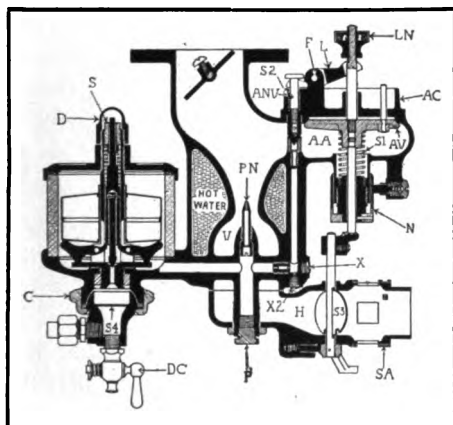
Chairman Luther apparently coincides with this viewpoint. The commission of which he is the head is to procure a high powered automobile, which will be manned by police officers in citizen's dress with instructions to work in all sections of the city and apprehend those who are manifestly operating in a reckless manner. The plan is believed to be new and to be worthy of extended trial.



# CARBURETING THE FUEL IN COLD WEATHER.

**W**HILE it is admitted that the present grade of motor fuel is more difficult to vaporize in cold weather than the gasoline utilized several years ago, the owner of a modern car experiences less difficulty in starting than did the operators of early models because the carburetor manufacturer has incorporated devices for enriching the mixture, these being controlled from the seat. Control of both air and fuel is now possible and with the carburetor set properly the motorist should not experience trouble, providing he is careful to strain all fuel and empty the filter.

While it is recommended that the mixture be not changed if the results have been satisfactory, a knowledge of the carburetor is important in the event it becomes clogged with foreign elements, or has been disassembled in the overhaul, for example. In tuning up the motor after the overhaul it is possible that the original adjustment of the carburetor may have been altered and resetting will be necessary. Lack of space prevents discussing each type of carburetor, but views of three standard makes with their components lettered are presented herewith, and will prove of service in making adjustments, etc.

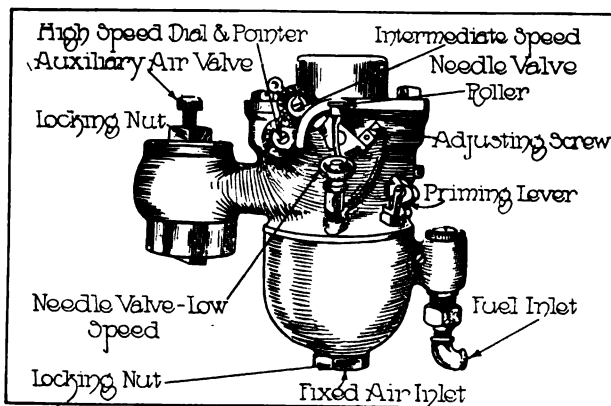


Components of Stromberg Carburetor.

than one-quarter in starting in cold weather, stating that a greater opening will create difficulty. This instrument is provided with a dash adjustment, making possible a rich mixture, as it lifts the needle out of the nozzle. Operating the priming attachment aids, in that a puddle of gasoline is formed in a dam. After the motor becomes warm the dash lever should be set to running position.

The carburetor is set by turning the low speed screw to the left until the arm member above it and slightly to the right just breaks contact with the cam above that. Next, turn the low speed screw 1.5 turns to the right, open throttle about one-quarter turn, and start the motor. Close the throttle until the motor runs slowly without stopping, then turn the low speed screw to the left, cutting down the fuel, and do this one notch at a time until the engine idles smoothly. Open the throttle slowly until wide open. If the motor backfires, turn the high speed adjusting screw to the right, a half turn at a time, until each cylinder fires evenly. Should the motor not backfire, turn the high speed screw to the left until it does, then to the right until it runs smoothly. The low speed should not be touched in setting the high, but should the motor backfire with the throttle about one-quarter open, the automatic air valve should be turned to the right a turn or two, decreasing the amount of air slightly. The automatic valve should be seated when motor is idling.

The adjustment of the Schebler carburetors is similar, with the exception of the new model R, announced recently. That shown herewith is the L, and like the F, has a single jet. Model O has two needles, a low and a



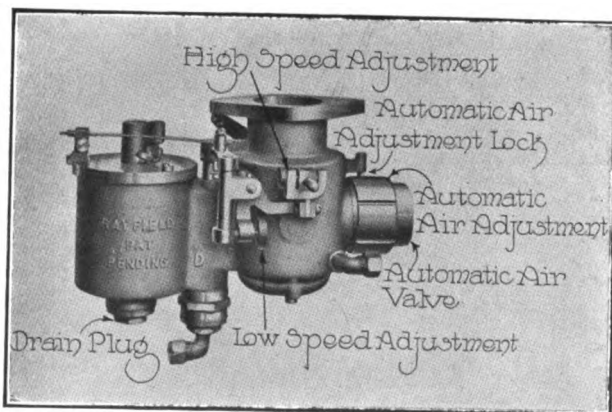
Three Adjustments Are Provided on the Schebler L—Low, Intermediate and High.

high. The model F has one numbered dial; the L two. To adjust the L retard the spark, open the needle valve about 1.5 turns and start the motor. The throttle should be about two-thirds way open. Screw the low speed needle valve in or out until the motor runs smoothly, but if it operates too fast, move out the adjusting screw which controls the butterfly valve closing point. If the motor stops increase the opening.

The high speed is obtained by setting the arms or pointers on the dials, of which there are two. These are numbered 1, 2, 3. Adjust the intermediate speed first, moving the arm midway between 1 and 3. Next, advance the spark and open the throttle so that the roller moving on the track like member beneath the dials is in line with the intermediate speed dial. The auxiliary air valve should seat lightly. If the motor backfires, move the arm toward the figure 3. If too rich, move toward the figure 1. The high speed adjustment is made with the other dial and with the throttle wide open.

The operation of the Stromberg carburetor is made clear by the sectional view, and it will be noted that there are two adjustments, a low and a high. The low speed member N is turned up or down until the spring seats lightly, then turned three additional notches. The air valve should not move until the motor attains approximately 500 revolutions a minute. The high speed is obtained by means of the nut L N, which is turned down to increase the supply of fuel and up to decrease the amount. There should be at least .03125 or .09375 inch between the nut and the lever L. The spraying nozzle P N is accessible by removing the plug member P.

In setting any carburetor it should be remembered that cold weather has the effect of too much air.



The Rayfield Has Two Fuel Adjustments, Also Automatic Air Setting.



## FUEL CONTROLLING DEVICES.

**W**HEN it is considered that with the average motor only approximately 17 per cent. of the heat realized from a gallon of fuel is converted into useful work, and that the balance is lost through the water jackets, radiation and exhaust, the cost of gasoline is indeed an important factor in the operation of a motor vehicle.

To obtain maximum efficiency from the fuel, three factors must be considered, namely: Proper proportions of fuel and air, inflammability of the mixture, and the spark. Economy of fuel, in which practically every motorist is interested, is obtained by utilizing as lean a mixture as possible without sacrificing efficiency. With the modern car, control of the air is provided by dash adjustments, the carburetor maker incorporating the device in his endeavor to increase the mileage obtained from a gallon of fuel.

### Over Rich Mixtures.

Owing to the fact that a slightly rich mixture makes for easier starting, many motorists increase the ratio of fuel to air, generally resulting in too rich a mixture at higher motor speeds, an adjustment not only making for a waste of fuel, but one affecting efficiency to a greater or lesser extent. Obviously, the remedy would be to increase the supply of air or decrease the amount of fuel, suitably proportioning the two elements so as to compensate for varying speed, atmospheric conditions, altitude, etc.

### Correct Mixtures.

As previously stated, the perfect mixture is one having so many parts fuel and air—a quick burning one—the resultant of properly vaporized fuel intermingled with the atmosphere. And the more air that can be utilized, with the vapor,

without sacrificing efficiency, the greater the economy.

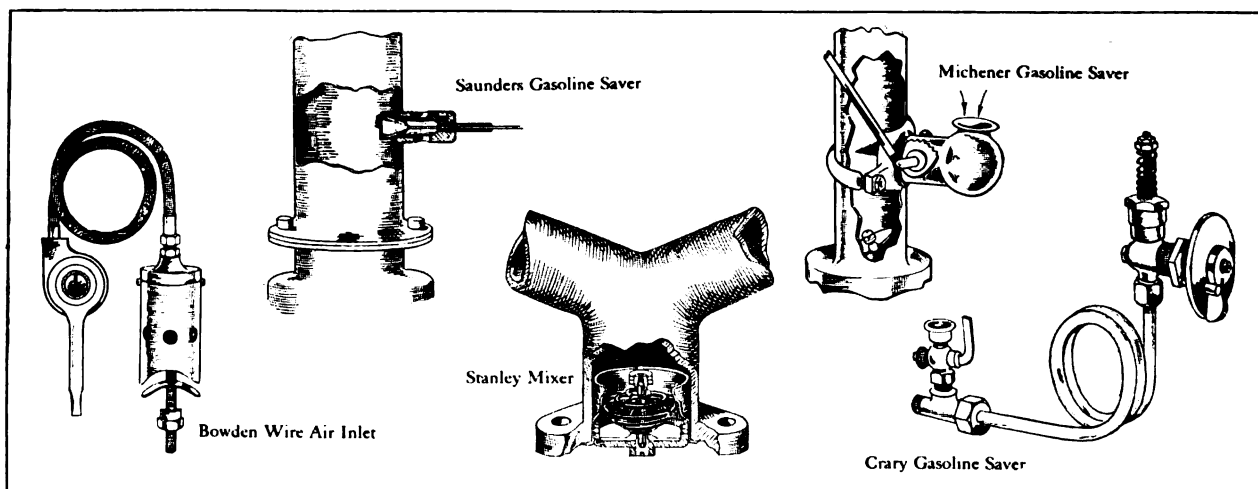
Fuel economizers may be divided into two general classes, one breaking up or pulverizing any molecules of fuel not vaporized and mixing the atoms with air. The other method consists of introducing auxiliary air into the intake manifold between the carburetor and the cylinders, and includes means for controlling the amount of atmosphere admitted. The impact of the air also breaks up any particles of fuel not vaporized. The advantages claimed in these fuel savers are: Economy of fuel, greater efficiency, cooler motor, less carbon, priming features and flexibility.

### Mixing Devices.

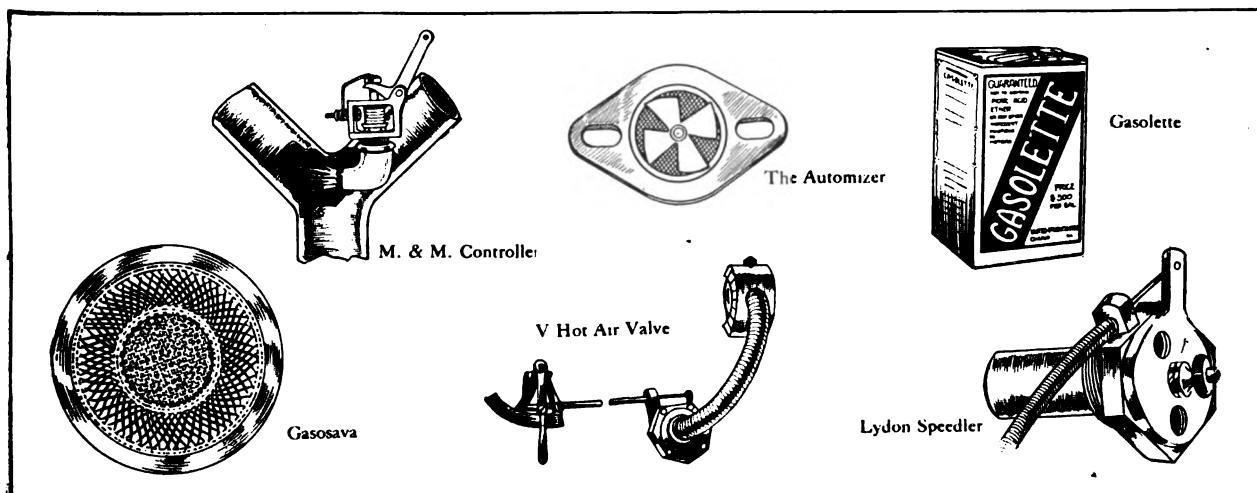
Three types of mechanical mixing devices are shown herewith, these being fitted between the carburetor and intake manifold by simply removing the bolts retaining the carburetor pipe, slipping in the mixer and replacing the bolts. Both the Stanley, made by W. P. Deppe, 127 Duane street, New York City, and the Automizer, manufactured by the Automizer Company, Canton, O., make use of a rotary device imparting a whirling motion to the mixture. The Gasosava, made by the Gasosava Company, Inc., 1270 Broadway, New York City, utilizes a wick like screen, so proportioned and constructed as to screen as well as break up the fuel.

### Bowden Auxiliary Air Inlet.

The Bowden auxiliary air inlet, marketed by the J. S. Bretz Company, 250 West 54th street, New York City, comprises a cylindrical body, curved at the base to conform to the shape of the intake pipe, and having a number of apertures. Within the body is a plunger which, in its nor-







mal position, completely closes the openings. When more air is required the plunger is moved upward by means of Bowden wire mechanism, gradually uncovering the ports and allowing air to be drawn in. Control is by lever as shown.

#### **Michener.**

The fuel saver manufactured by E. S. Michener, New Castle, Penn., is made for both dash and steering post control and has a priming feature. It is very compact, is screwed into the intake manifold and has a cone shaped screen projecting across the bore of the intake pipe at right angles. Control of the air is by a rod having universal joints. The primer comprises a bowl shaped member and the air valve is held in an adjusted position by means of a spring catch which engages a ratchet on the valve stem.

#### **M. & M. Controller and Economizer.**

The M. & M. controller and economizer has been described and illustrated in these columns. It differs from usual fuel savers in that its valve may be adjusted for either a low or high-tension magneto; that is, the ignition may be cut out as desired, as when descending grades for example. The opening of the ports, admitting air, is controlled from the steering post. The controller is fitted to the intake manifold as shown by an accompanying illustration, which also outlines the valve construction. It is manufactured by the M. & M. Sales Company, Inc., Lewistown, Penn.

#### **Saunders.**

The Saunders, marketed by the Powers Sales Company, 122 South Michigan avenue, Chicago, is fitted to the intake pipe above the carburetor, by drilling and tapping a .375-inch hole. The air enters through four large holes and the passage leading to the interior of the intake pipe has a cone shaped plunger which is controlled by a

flexible wire connected with a lever on the steering column. The plunger is made cone shaped to increase the velocity of the air, which the maker states enters at such angle as to effect complete vaporization of fuel.

#### **Crary Auto-Valve.**

The Auto-Valve, manufactured by the Crary Company, 652 Woodward avenue, Detroit, combines fuel saving and priming features. It comprises two parts, a lever control located on the dash, which closes and opens an automatic air valve under the hood, and a connection to the intake manifold just above the carburetor. The priming device comprises a petcock in the line. The automatic valve is adjustable, lock nuts being provided on the top of the spring.

#### **Lydon Speedler.**

The Lydon Speedler, made by the Lydon Manufacturing Company, 1146 Michigan avenue, Chicago, was described and illustrated in the June 10 issue of The Automobile Journal. It is inserted in the intake pipe, operated from the seat and the amount of air admitted is varied according to conditions.

#### **V Hot Air Valve.**

The V hot air valve, made by the V Air Valve & Manufacturing Company, 1648 Tremont street, Denver, Col., differs from the devices above described in that hot air is conveyed to the intake manifold through a flexible tubing, one end of which has a hood for clamping to the exhaust pipe. Control of the amount of the heated air is by the usual steering column lever.

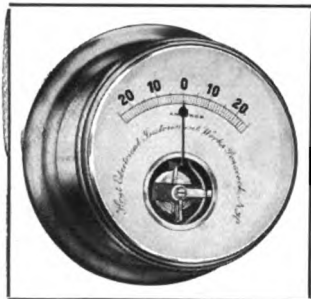
#### **Gasolette.**

Gasolette, made by the United Products Manufacturing Company, 1463 Michigan avenue, Chicago, is a preparation which is mixed with the fuel in proportions of half an ounce to a gallon. It comes in quarts and gallons.



## SELECTING ELECTRIC LIGHT EQUIPMENT.

**W**HILE it is possible to secure a complete electric lighting equipment, the majority of the makers of dynamos leave the choice of



**Hoyt Ammeter.**

lamps, switches, meters, cable, etc., to the purchaser, although suggestions are made as to the material to be employed. It is poor economy to buy cheap equipment, especially lamps, for the most efficient lighting dynamo is severely handicapped by poorly designed lamps, inferior wiring, etc.

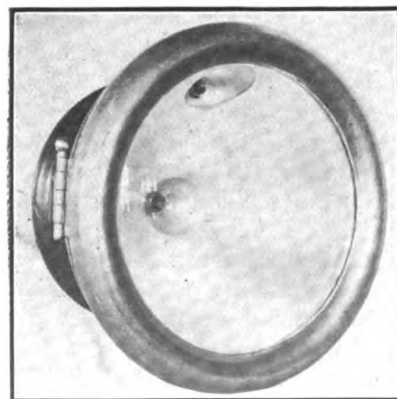
The lamp manufacturer has made considerable improvement in his product during the past year, and not only are the designs attractive, but greater efficiency is obtained with the new types, the majority of which are provided with means for securing proper focal adjustment, an important factor in lighting systems.

### Lamp Specifications.

The size of the lights is determined to a great extent by the size of the car, and the owner will have to be guided by the recommendation of the maker of the dynamo. A list of lamp manufacturers will be found in the Buyers' Guide, elsewhere in this issue, and the concerns listed will forward complete data on request.

As previously mentioned, the lamp equipment will depend upon the car and the owner. Side lights may be eliminated, as there is a growing

tendency to equip the headlights with double bulbs, as indicated by the Guide design, made by the Guide Lamp Manufacturing Company, Cleveland, O., shown in an accompanying illustration. The smaller light is



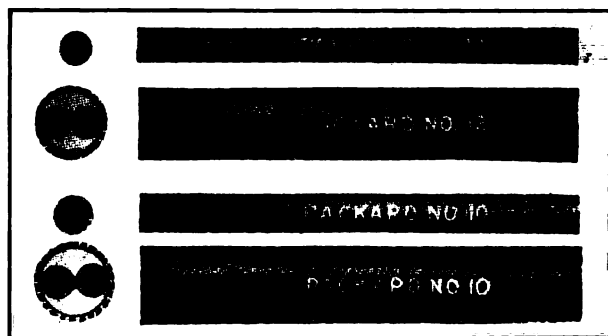
**Guide Double-Bulb Headlight.**

employed in the city, etc., and where the ordinances prohibit the use of powerful headlights. Dimming devices also serve the same purpose.

All-glass lamps are now marketed, these including head and tail members.

### Proper Cable to Use.

Too much emphasis cannot be laid upon the importance of utilizing a high grade lighting cable and employing caution in wiring so as to avoid the possibilities of short circuits, due to abrasion, vibration, action of water, etc. The product of the Packard Electric Company, Warren, O., is shown herewith, the No. 10 and 12, both in single and double-conductor form, being illustrated. The construction is the same as characterizes the Packard ignition cable made by this concern. The No. 14, made in one and two-strand, is recommended for wiring tail lights, and the No. 12 single and double for side and headlights. The larger size, the No. 10, is used for wiring from the generator to the battery, thence to the switches, also for large headlights. Single



**Showing Construction and Exterior View of One and Two-Strand Packard Lighting Cable.**

or double strand is employed, according to the installation. The maker of the Packard cable guarantees its product.

### Switches.

There is a wide variety of switches manufactured and in the selection one will have to be guided by the lighting system. If a group of lights is to be controlled, such as side, head, tail and speedometer, a multiple unit will be required. These are also constructed to control each side or headlight; in fact, a number of combinations is afforded.

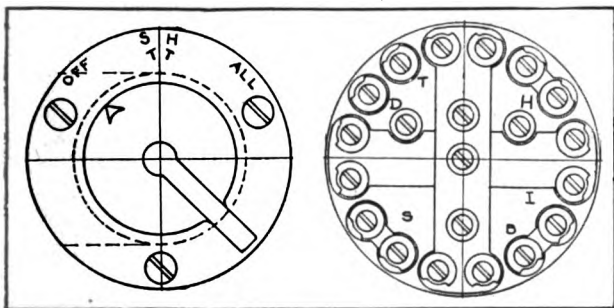
A form of rotary switch made by the Hartman Electrical Manufacturing Company, Mansfield, O., is shown in an accompanying illustration and it is made in several types. As will be noted in the drawing at the left, it is possible to obtain any combination of or all lights. A junction ring, a separate unit, is a feature of the switch, the maker stating that it provides ready



means of attaching the wires and eliminates splicing and soldering. As shown, it provides for 16 wires, these including, in addition to the lights, connections for the battery, ignition, etc. A dimmer device, comprising a centre push and pull switch, is supplied with the junction ring when desired, it changing from a parallel to a series connection. This permits of eliminating side lamps and utilizing head members. It is stated that the current consumption on the basis of 16 candlepower bulbs will be a little over one ampere in excess of that taken by the usual four candlepower side lights. The Hartman switch may also be employed where double-bulb head-lights are utilized.

#### Voltmeters and Ammeters.

Accurate reading instruments are essential with the lighting system and these may be voltmeters, ammeters or a combination of the two, according to the equipment. The ammeter is mounted on the dash in plain view of the driver, and indicates at all times the amount of current



**Hartman Rotary Switch, a Multiple Unit—Also Made with Junction Ring and Dimming Attachment.**

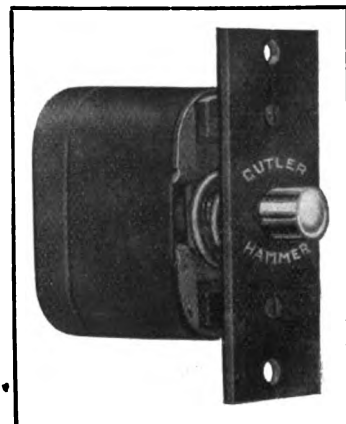
produced by the generator or discharged by the battery. When the indicating needle points to the left of the zero point, for example, it denotes that the battery is supplying current to the lights or discharging. With the needle pointing to the right of zero it means that the generator is charging the battery. The amount or rate of charge and discharge in amperes is denoted by the needle moving over a calibrated dial. The ammeter does not show the amount of current in the battery. There is no instrument made which will show this.

#### Hoyt Instruments.

The Hoyt Electrical Instrument Works, Penacook, N. H., manufactures a wide variety of indicating instruments, one of which, an ammeter, is shown herewith. This instrument is very compact and is constructed with the same care and high grade material as characterizes the product of this concern, which has made a specialty of current indicating and reading devices

for years. The Hoyt company also manufactures voltmeters in several forms, these being utilized to test the cells of a storage battery.

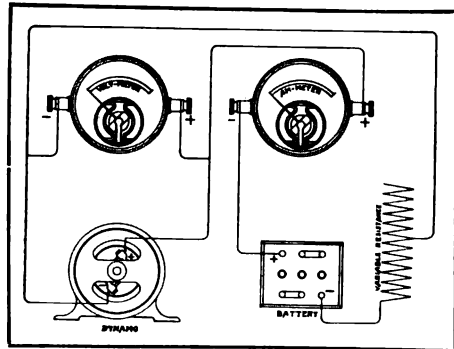
As the battery is one of the most important components of the lighting system, a high grade make should be utilized. The voltage and capacity will depend upon the system selected. Representative makes are listed in the Buyers' Guide, and elsewhere in this issue will be found a discussion on the care and maintenance of the cells of the storage battery.



**Cutler-Hammer Automatic Door Switch.**

Relative to the lamp equipment it is not absolutely essential to purchase new members as the acetylene head, oil side and tail lights may be converted into electrical units. No attempt has been made to describe these, but they may be obtained readily, a large number of different types being marketed. The matter of connectors, junction boxes, fuses, etc., may be referred to the maker of the dynamo, who will supply complete information, including wiring plans of the system.

The Empire Automobile Company, Indianapolis, Ind., has prepared an interesting booklet, entitled, "The Transcontinental Empire", which comprises an interesting, illustrated account of the Empire car, which took part in the recent Indianapolis-Pacific tour of the Indiana Automobile Manufacturers' Association. The text was written and the photographs taken by Harlow Hyde, advertising manager of the company, and the booklet should prove of decided interest to motorists, who may secure a copy by making request of the company.

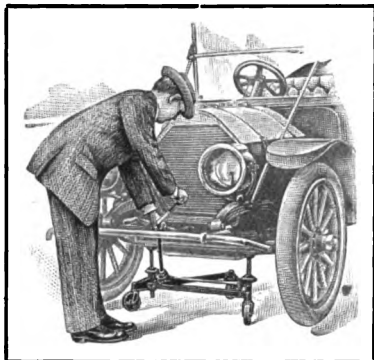


**Wiring Plan of Volt and Ammeter.**



## STORING THE CAR AND OCCASIONAL USE.

**A**LTHOUGH the motor car is an all-around-the-year vehicle, some owners store their machines upon the arrival of cold weather. In



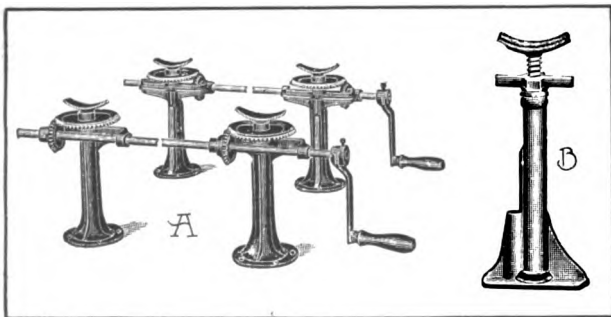
Weaver Twin Jacks Marketed by Ralph Walcott, New York City.

putting the car away for the winter it should be borne in mind that its condition and appearance will be important factors in the event it is to be sold or traded in the spring.

First of all, it should be carefully washed and dried, and if it is to be stored in an unheated building, the tires ought to be removed and treated according to the instructions contained elsewhere in this issue. The top and upholstery should be cleaned and there are a number of preparations for treating leather and other materials. It is advisable to fit the curtains in place and keep the top up, thereby eliminating creases. Clean and polish the metal trimmings and coat with vaseline or polish.

### Care of Power Plant.

All water must be drained from the circulation system, and it is a good plan to clean the radiator with a soda solution or a prepared mixture. In connection with this work it is important that all fluid be drained from the cooler, pump, hot water connections, etc., especially if the car is to be stored in a cold building. It is poor practise to allow the motor to stand all winter with the tension of the valve springs unrelaxed, as the elasticity is impaired. Remove the spark plugs and pour about half a pint of kerosene into



Tire Rests and Jacks; A, Springfield Combination; B, Storage Stand of Same Make.

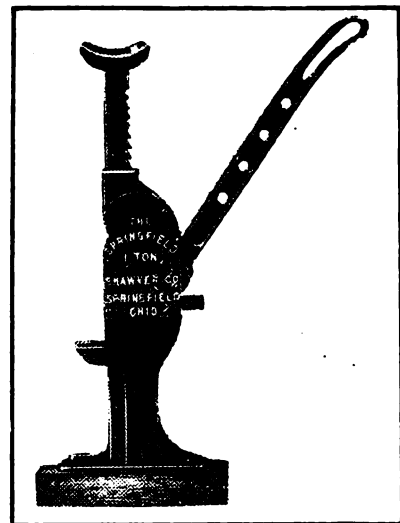
each cylinder and then replace the plugs.

It is an excellent plan to jack up the frame so that the springs will be relieved of all weight. Wooden supports are made easily and by placing them under the frame the tension of the springs will be relaxed. It will also enable one to clean and lubricate the springs if desired, by using a thin bladed tool or one marketed for the work. If a storage battery is utilized it should be removed and treated according to the instructions published elsewhere in this issue.

### Covering the Car.

After cleaning, etc., the car should be completely covered and care taken not to expose it to the rays of the sun. If near a window, pull down the shade or cover the window with some material that will not admit sunlight.

When the car is to be used occasionally, as on mild, pleasant days, for example, it should be jacked up to relieve the tires of all weight. Although it is best to deflate the casings, unless the equipment includes a power tire pump, this method will require repump-



Springfield Tire Rest.

ing the shoes by hand. It is advisable to cover the car when not in service and to wash it if needed.

In accompanying illustrations are presented several forms of storage stands, quickly operated jacks, etc., making for convenience when the car is to be used occasionally. These come in sets of two and four and are moderately priced.

The Moon Motor Car Company, St. Louis, Mo., maker of the Moon car, has installed an axle testing machine, by means of which it is maintained that it is possible to obtain the same results as from at least 500 miles of road travel. The chief object of the device is to indicate the proper adjustment of differential and brakes under all conditions of service.



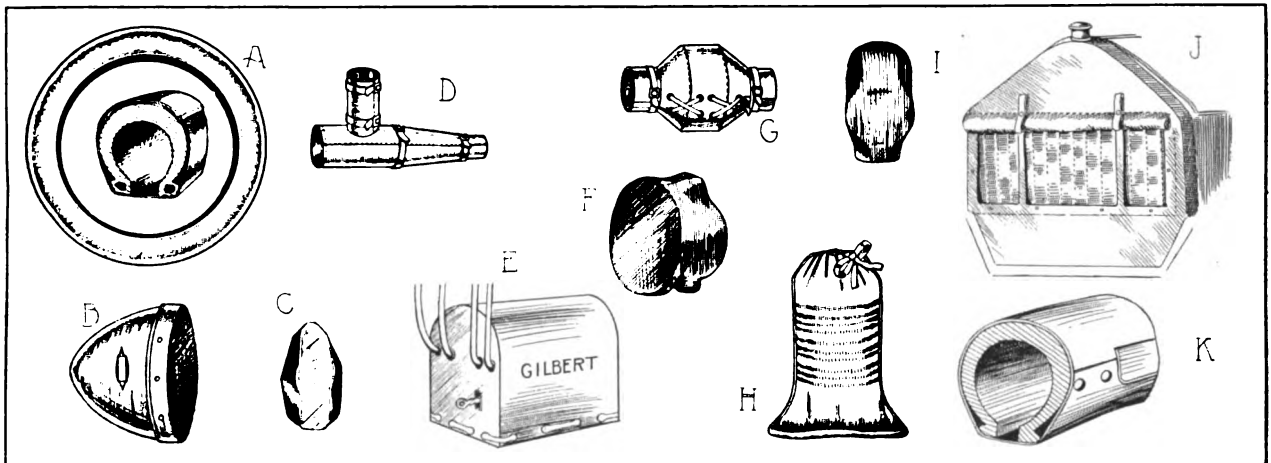
## TIRE, TUBE AND LAMP PROTECTORS.

**M**OISTURE is one of the enemies of tires in that it causes deterioration of the fabric, and if for no other reason the spare casings should be enclosed in a tire cover when carried on the car. The practise of some motorists to carry the shoes without a protective covering is not to be recommended, for during the washing of the machine much water is likely to find its way inside of the casing. Tire makers advise covering the new spare shoes, for the action of sunlight and air upon the compound develops tiny cracks and in time the life of the rubber is impaired.

Tire cases are not expensive and two well known makes are presented in an accompanying illustration, these being the product of the Gilbert Manufacturing Company, New Haven,

The Hopewell case, also in sectional view, is shown at A. This is a continuous casing, being wrapped around the tire and retained by two endless spiral springs, eliminating the use of fastenings. The adjustment of the springs is such as to permit the cover to be used on old or new tires. The construction is not only easily and quickly applied, but prevents wrinkling. The cover is made of fabric leather, all colors, black enamel duck, etc., for different sizes and types of tires and rims, and each cover comes in an enamel duck bag suitable for an inner tube bag. The company also makes the Russell and Go-On cases.

Radiator covers of the adjustable type not only protect the cooler in cold weather, but permit of maintaining the water at a proper work-



**Covers and Protectors:** A, Hopewell Design for Tires and a Sectional View; B, Gilbert for Electric Lamps; C, F and I, Hopewell for Tail, Side and Headlights; E, Gilbert Magneto Cover; D and G, Gilbert End Thrust and Universal Joint Boots; J, Autocape Top Company's Radiator Cover; H, Miller Tube Bag; K, Sectional View of Gilbert Tire Cover.

Conn., and Hopewell Bros., Newton, Mass. A sectional view of the Gilbert is shown at K and it is made with either snap button or wire edge fasteners. The case has the Teel patented water-shed construction extending over one-half of the circumference, and when it is fitted to a tire the latter is so mounted that the water-shed section is at the highest point with the shoe in an upright position. Additional water proof features are provided by the strip holding the caps of the fasteners overlapping the lower section. The company manufactures a wide variety of cases, including members for all types of rims, and in various colors. The material includes black enamelled duck, fabric leather (any color), mohair (any color), black patent leather and any color of grain leather.

ing temperature. With the fluid too cold, maximum efficiency is not obtained from the motor. The Autocape Top Company, 2334 Michigan avenue, Chicago, is marketing the design shown at J, and it will be noted that an adjustable curtain is provided and retained by snap buttons.

Lamp covers not only preserve the finish of the lights, but save considerable labor in cleaning. Designs for electric, oil and gas are shown herewith, the product of the Gilbert Manufacturing Company and Hopewell Bros., who will forward illustrated catalogues on request.

Extra inner tubes should be carried in a tube bag and a serviceable member is being marketed by Chas. E. Miller, 97-103 Reade street, New York City, with branch houses in 13 cities, for a very small sum.



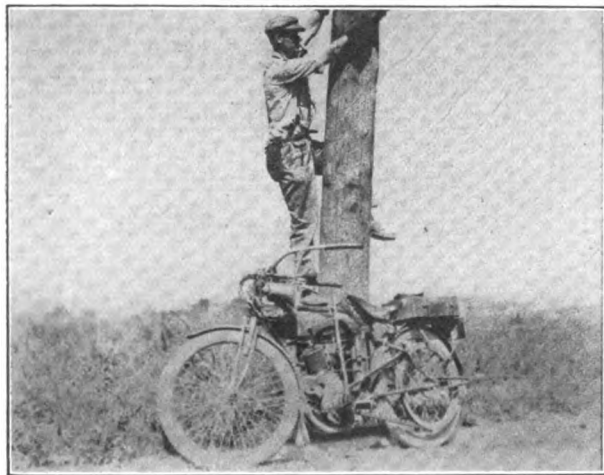
## IN THE REALM OF THE MOTORCYCLIST.

### Additional Exhibits at the Chicago Show--Long Distance Cross Country Trip on Kerosene--Recent Racing Results--Other News and Notes.

**I**N THE preliminary report concerning the Chicago motorcycle show held early in the month, specifications and details were given of 18 makes of machines on display there. Information concerning five other makes shown was not available at that time. These machines are considered briefly below.

#### De Luxe Two-Speed New.

Practically the only change in the De Luxe line presented by the Excelsior Cycle Company, Chicago, is the addition of an Aurora two-speed gear. The line comprises four models, two seven horsepower twins and two nine horsepower twins, one in each horsepower classification being equipped with the two-speed gear. Equipment



**Flying Merkel in Service with Trouble Man of Middletown Telephone Company, Middletown, O.**

includes Bosch magneto, Eclipse countershaft clutch, Musselman coaster brake, Corbin front axle, Troxel saddle and any make of three-inch tires.

#### New R-S Twin.

The Reading-Standard Company, Reading, Penn., displayed a five horsepower chain drive single, five horsepower two-speed single, seven horsepower undergeared belt drive twin and 10 horsepower two-speed twin. The last named is new. The features of the motor include: Long stroke, mechanically operated valves, cylinders removable without taking motor from the frame, unit power plant, double clutch control and double brake control. Equipment on all models

includes Bosch magneto, Schebler carburetor, Corbin V band and R-S contracting band brakes, Troxel saddles, Goodyear tires, etc.

#### Two Eagle Models.

The American Motor Company, Brockton, Mass., exhibited two nine horsepower twins, one being a continuation of the model marketed last season, and the other being fitted with a direct drive. Save for the transmission, the two are alike in every respect. The equipment includes Bosch magneto, Schebler carburetor, Eclipse clutch, Mesinger saddle, etc.

#### New Michaelson Line.

The Shapiro-Michaelson Motor Company, Minneapolis, Minn., which was incorporated Nov. 1 to continue the Michaelson line introduced for the first time a year ago, presented two models, a 5-6 horsepower single and a 10-13 horsepower two-speed twin. The motors have the same bore and stroke, 3.5 by 3.75 inches. The valves are mechanically operated. Both models are fitted with a two-speed transmission and multiple disc clutch and foot starter. In addition, the twin is supplied as a delivery tricar, with carrying capacity of 500 pounds.

#### Pierce Four and Single.

The Pierce Cycle Company, Buffalo, N. Y., exhibited its eight horsepower four-cylinder model and a five horsepower chain driven single. The changes are few and largely in the nature of refinements. The equipment includes Berling magneto, Breeze carburetor, Eclipse clutch (on single), Corbin brake, Goodyear, Diamond or U. S. studded tires.

#### With the Accessory Exhibitors.

The accessory division of the show was in every respect in keeping with the importance of the motorcycle section. While many of the manufacturers and jobbers making display also cater to automobile owners, their exhibit in each instance was calculated to appeal only to motorcyclists. Among the more prominent concerns represented were the following:

Bosch Magneto Company, New York City, magnetos, spark plugs and mechanical oilers; Hawthorne Manufacturing Company, Bridgeport, Conn., Old Sol lamps and a new combined lighting outfit and universal bracket; Herz & Co., New York City, magnetos and spark plugs; Marburg, Bros., New York City, Mea magnetos, S. R. O. combined radial and thrust ball bearings and Lucifer electric lighting equipment; A. R. Mosler & Co., Mount Vernon, N. Y., spark plugs; Splittdorf Electrical Company, Newark, N.





# For 1914

## MODELS and PRICES:

|            |          |                |                        |          |
|------------|----------|----------------|------------------------|----------|
| Model 440— | 4 H. P., | Belt Drive,    | Single Cylinder,       | \$210.00 |
| Model 441— | 4 H. P., | Chain Drive,   | Single Cylinder,       | \$210.00 |
| Model 470— | 7 H. P., | Belt Drive,    | Twin Cylinder,         | \$250.00 |
| Model 471— | 7 H. P., | Chain Drive,   | Twin Cylinder,         | \$250.00 |
| Model 473— | 7 H. P., | Self-Starting, | "Yellow Jacket" Model, | \$290.00 |

### ALSO

|            |          |              |                     |          |
|------------|----------|--------------|---------------------|----------|
| Model 477— | 7 H. P., | Chain Drive, | "Challenger" Model, | \$225.00 |
|------------|----------|--------------|---------------------|----------|

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**Immediate Deliveries of Genuine Guaranteed  
1914 Models in Carload Lots or Less**

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*Wire for Territory today.*

**New England Branch** **315 Dwight Street**  
**Springfield, Mass.**

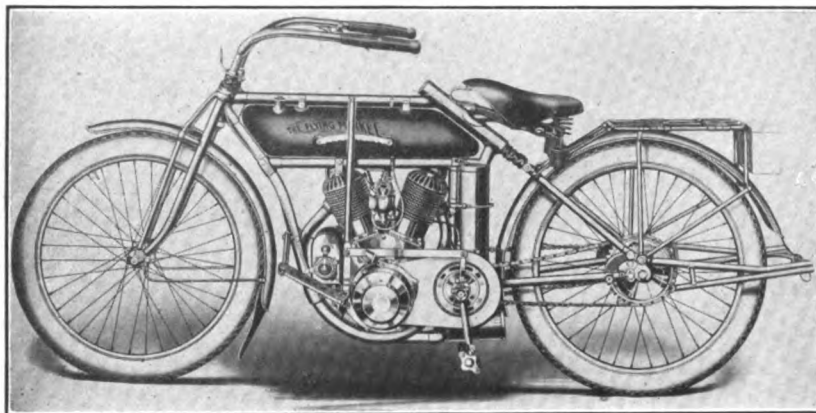
**The Miami Cycle & Manufacturing Co.**  
**320 Hanover Street** **Middletown, Ohio**



J., magnetos and spark plugs; Dean Electric Company, Elyria, O., Maxo II electric horns; Randall-Faichney Company, Boston, Mass., Jericho exhaust horns, gasoline and grease guns and Blitz spark plugs; Benford Manufacturing Company, Mount Vernon, N. Y., Monarch spark plugs; Peter A. Frasse & Co., New York City, tools and supplies and Renold chains; Motor Car Supply Company, Chicago, motorcycle and bicycle supplies; H. & F. Mesinger Manufacturing Company, New York City, Mesinger saddles and grips; New Departure Manufacturing Company, Bristol, Conn., New Departure bearings and coaster brakes; Rhineland Machine Works, Chicago, imported ball bearings; Standard Welding Company, Cleveland, O., tubing, rims and electrically welded parts; Stewart-Warner Speedometer Corporation, Chicago, Stewart motorcycle speedometers; Weed Chain Tire Grip Company, New York City, Weed anti-skid motorcycle chains.

### Chicago-Kokomo Run.

Thirty-two riders took part in the recent two-day run of the North Shore Motorcycle Club of Chicago from that city to Kokomo, Ind., and return, a distance of 250 miles. The Yale, Thor and Henderson teams being tied with perfect scores at South Bend on the second day, it was decided to establish secret controls throughout



The 1914 Model of the Self-Starting Yellow Jacket Flying Merkel.

the remainder of the distance. The Thor and Henderson trios suffered because of this and the silver trophy was awarded to the Yale team. The final scores follow:

Perfect—W. S. Bailey, Ray F. Ray and I. F. Jacobs, Yale team; Harvey Barnard, C. W. Waughop and C. H. Drude, Henderson team; W. F. Brier, Jr., H. E. Bowe and J. F. Hough, Thor team; R. L. Kenny, Harley-Davidson; H. C. Scherer, Harley-Davidson; J. F. Newcas, Excelsior. George E. Miller, Excelsior, 999; M. Tannanbaum, Excelsior, 998; R. T. Fletcher, Excelsior, 988; R. B. Gardner, Excelsior, 985; E. W. Kewley, Excelsior, 984.

### In Telephone Service.

An accompanying illustration shows one of the Flying Merkel motorcycles used by the Middletown Telephone Company, Middletown, O., in its trouble department. This machine has displaced two horses, with a corresponding reduction in expense, to say nothing of the more efficient service rendered. Similar machines are being used with equal satisfaction, insofar as econ-

omy and efficiency are concerned, by numerous other telephone companies, gas companies, department stores, rural mail carriers, etc., throughout the country. In fact, business men in every line throughout the country are beginning to appreciate the value of the two-wheel mount for service requirements of various character.

### Buys Greyhound Business.

Announcement is made from Buffalo, N. Y., that the Autocrat Manufacturing Company of that city has purchased the plant and sidecar and accessory business heretofore conducted by the Greyhound Motor Company. W. C. Chadeayne, who was at the head of the old concern, will be general manager of the Autocrat company.

### The New Flying Merkel.

Changes in the Merkel line, produced by the Miami Cycle and Manufacturing Company, Middletown, O., consist mainly of refinements. The motor has been improved by the use of a new piston of standard pattern, with the wristpin located in the vertical centre, for the purpose of giving both ends of the piston an equal bearing on the cylinder walls. The piston rings are of the eccentric type and ground on three sides. The improvements in the valve mechanism include a new cam of reduced size. The rockers are now provided with hardened and ground steel rollers at the cam ends. The tappet guides are phosphor bronze bushings of large size, both in diameter and length. The intake valve tappets are provided with cushion springs, taking up lost motion. An accompanying illustration presents the 1914 self-starting Yellow Jacket model, and, as indicated in the last issue, the prices on all models have been reduced materially. They are as follows: Model 40, four horsepower single, belt drive, \$210; 41, same with chain drive, \$210; 70, seven horsepower twin, belt drive, \$260; 71, same with chain drive, \$260; 73, self-starting Yellow Jacket, seven horsepower twin, chain drive, \$310. All machines will be fitted with luggage carrier, footboards and foot starter without additional charge.

### Recent Racing Results.

The following summaries indicate the results in recent race meets throughout the country:

#### Columbia, S. C.

Three miles, singles—First, Gerard, Indian; second, Glenn, Excelsior; third, Williams, Indian; time, not given. Five miles, singles—First, Gerard, Indian; second,



Glenn, Excelsior; third, Williams, Indian; time, 5:20.

Ten miles, singles—First, Gerard, Indian; second, Williams, Indian, third, Glenn, Excelsior; time, 11:26.2.

Three miles, twins—First, Glenn, Excelsior; second, Buford, .....; third, Gerard, Indian; time, 3:13.

Five miles, twins—First, Glenn, Excelsior; second, Buford, .....; third, Gerard, Indian; time, 5:05.

Ten miles, twins—First, Buford, .....; second, Gerard, Indian; time, 10:19.

#### Road Race, St. Paul, Minn.

One hundred and twenty miles—First, Slaby, Indian; second, Sanberg, Yale; third, Boyd, Dayton; time, 3:50:00.

#### Pensacola, Fla.

Five miles—First, Suggs, Indian; second, Sweeney, Excelsior; third, Johnson, Indian; time, 6:46.

Ten miles—First, Suggs, Indian; second, Sweeney, Excelsior; third, Johnson, Indian; time, 13:22.5.

### Schickel Burns Kerosene.

One of the most interesting features that was noted in connection with the recent annual motorcycle show at Chicago was the cross country trip made by Victor Brunzel, who covered the 1380 miles between the factory of the Schickel Motor Company, Stamford, Conn., and the Coliseum in Chicago on a five horsepower, belt driven, Schickel single, utilizing kerosene as fuel. It is stated that the machine was stock in every particular, even to the carburetor, except for a slight readjustment of the air valve and needle valve to accommodate the heavier fuel. A small auxiliary tank, containing a limited supply of gasoline for starting purposes, also was fitted.

Brunzel was on the road 11 days, and averaged 85 miles a day. His longest day's run was 116 miles and the shortest 55. The ride was interrupted on five days because of rain. Brunzel declares that the machine operated perfectly, the two-cycle motor never failing to respond on kerosene once it was started. No statement is made as to the amount of kerosene consumed.

#### Other Long Distance Riders.

Other riders who came to the show from distant points on their machines were M. E. Gale and Ray Frawley from Angola, N. Y., on an Emblem twin, with side-by-side seating arrangement; Walter H. Bell, from Omaha, on a seven horsepower Indian twin; August Schlaefflein from Dayton, O., on a Harley-Davidson twin; Mr. and Mrs. A. P. Stroganoff from Schenectady, N. Y., on another side-by-side Emblem, and H. L. Clark from Worcester, Mass., on an Indian.

#### General News Notes.

Mr. and Mrs. James Henderson, White Plains, N. Y., recently completed a 2000-mile trip on a twin motorcycle.

R. L. Allen of San Francisco, Cal., is now on a 12,000-mile trip. He is riding to New York by the northern route and will return by the central.

An extensive motorcycle honeymoon trip is planned

by Mr. and Mrs. W. H. Hanlon of Columbus, O., who will visit New York, Boston, Montreal and Buffalo.

Mr. and Mrs. Oscar F. Becker of Milwaukee, Wis., have recently completed a honeymoon trip of 600 miles on their machine.

D. L. Reichard, Waynesboro, Penn., is riding his motorcycle to the Pacific Coast, where he will spend the winter, and will ride back again in the spring.

Charles A. Bottum, secret service agent of the War Department, is making his semi-annual inspection of the army and naval posts by motorcycle. He left Santa Monica, Cal., over a month ago and is gradually working his way across the continent to Virginia, visiting the various posts en route.

Rev. George W. Phillips, Hamilton, O., has planned a motorcycle tour through Jamaica and Porto Rico.

George B. Loveless, a mail carrier of Thornton, Ind., has been riding a motorcycle on a 33-mile route for the past three years and says that his entire upkeep expense, including repairs, oil and gasoline, does not exceed 26 cents a day, while if he were using a horse the least he could expect would be 80 cents.

F. J. Taylor of Portland, Me., is combining business



Pope and Harley-Davidson Riders in South Attleboro, Mass.: Left to Right, Joseph Ostiguy, Adelard H. Malo, Thomas Heap, Thomas Ostiguy, Lester Rowae and Clifford C. Walker.

and pleasure on a cross-continent motorcycle trip. He was married recently and shortly after was assigned to duty at a recruiting station at Bremerton, Wash. As his duties there did not begin for a month he decided to ride with his bride to their new home.

The police department of Birmingham, Ala., has doubled its motorcycle force.

Arrangements are well under way for the second national motorcycle road race of this season, which will be held on Christmas day on the automobile course at Savannah, Ga. The race will be for 300 miles and an award of \$500 will be given the winner. Riders from all over the country have entered.

The practicability of the motorcycle for salesmen has been demonstrated by F. A. Wall, salesman for a fire-proof storage company in St. Louis, Mo., who has ridden a machine in soliciting business for the past five years.

### JOIN THE F. A. M.

which is the National Organization fostering the interests of motorcyclists along legislative and other lines. Cut this out, mail it, and you will get the reasons.

#### E. M. ESTABROOK

Chairman Membership Committee Federation  
American Motorcyclists,  
BANGOR, MAINE.

Please send me the F. A. M. Booklet and all information interesting to prospective members.

Name.....

Address.....



# NEWS OF THE MANUFACTURER AND DEALER.

The following concerns have been incorporated recently to manufacture and deal in motor cars, accessories, etc.:

**Augustyn Rotary Valve Engine Company**, Marshfield, Wis.; \$10,000; to manufacture rotary valve engine; R. J. Strauss, G. E. Harrington, H. E. Hoerl.

**Briskin-Wolsiffer Company**, Indianapolis, Ind.; \$10,000; to manufacture parts and accessories; J. H. Briskin, H. W. Bullock, C. C. Wolsiffer.

**B. F. Wade Tire & Rubber Company**, Los Angeles, Cal.; \$50,000.

**Sterling-Detroit Motor Company**, Detroit; \$105,000; to manufacture automobiles; H. Little, E. Finkenstead.

**Essex Motors Manufacturing Company**, Newark, N. J.; to manufacture motors and supplies; W. H. Simpson, M. E. Huddeh, J. J. Coyle.

**Sterling Spring Company**, Cleveland, O.; \$150,000; to manufacture automobile springs; F. C. Wood, E. D. Lindersmith, D. P. Osborne, H. F. Ehler, J. A. Flajole.

**Federal Rim Company**, Detroit; \$5000; to manufacture automobile wheels; A. H. Goss, H. W. Bailey.

**Boston Starter Company**, Louisville, Ky.; \$5000; H. W. Batson, G. A. Chrisman, G. Cary.

**Baxter-Frick Gear Cutting Manufacturing Company**,

Hower, William T. Helfer, John Claude Stafford, John Johnsen.

**Dimond-Warren Motor Company**, Quogue, N. Y.; \$8000; to deal in automobiles and operate garage; James R. Dimond, Arthur C. Warren, Thomas Dimond.

**National Auto Maintenance Company**, Chicago, Ill.; \$5000; to deal in motor cars; J. F. Kelley, R. G. Melcher, C. N. Addis.

**Auto Tire Brokerage Company**, Louisville, Ky.; \$10,000; to buy and sell autos and tires.

**Public Motor Car Company**, Dayton, O.; \$10,000; to buy and sell all kinds of automobiles; H. H. Williamson, R. J. Williamson, C. E. Borth, Brice Welsh, M. Kawen.

**Artillery Auto Tire Protector Company**, Wilmington, Del.; \$100,000; A. J. Coppock, Indianapolis, Ind.; J. C. Wellington, H. C. May, Pittsburg, Penn.

## WITH THE MANUFACTURERS.

The **Cameron Manufacturing Company**, maker of the Cameron line of pleasure and commercial cars, is now established in its new home at West Haven, Conn., as announced in a previous issue. The accompanying illustration presents the plant, and is important evidence that the concern is admirably well equipped to increase its production facilities to keep pace with the demand for the product.

The **Auto Parts Company**, Providence, R. I., has secured a permit for the erection of a new building at Goff and Eddy streets. It will be of brick, one story high, 45 by 116 feet.

The **National Auto Radiator Company**, White Plains, N. Y., has started business at 159 Stanley street.

The **Kelly Reamer Company**, Cleveland, O., has increased its capital stock from \$25,000 to \$50,000 in order to provide sufficient funds for increasing the manufacturing facilities.

The **Palge-Detroit Motor Car Company**, Detroit, expects to have its new plant at Fort and McKinstry streets ready for occupancy on Dec. 1, and anticipates doing business at the new address on or about that time. The financial statement of the company for the quarter ending in September shows that the gross sales increased \$1,200,000 over the same period of last year.

The **Vulcan Rubber Company**, Erie, Penn., has secured the permission of the state officials to increase its capital from \$100,000 to \$200,000.

The **Russian Tyre Sales Company**, importer of Prowodnick tires, has been taken over by the Columb Tyres Imports Company. The salesrooms will be retained at 1891 Broadway and 71 Columbus avenue, New York City.

The **National Drawn Steel Company**, East Liverpool, O., has recently been organized with a capital of \$100,000 to manufacture drawn steel products, including automobile appliances, gas engines, etc. It is expected that operations will be started in a few months.

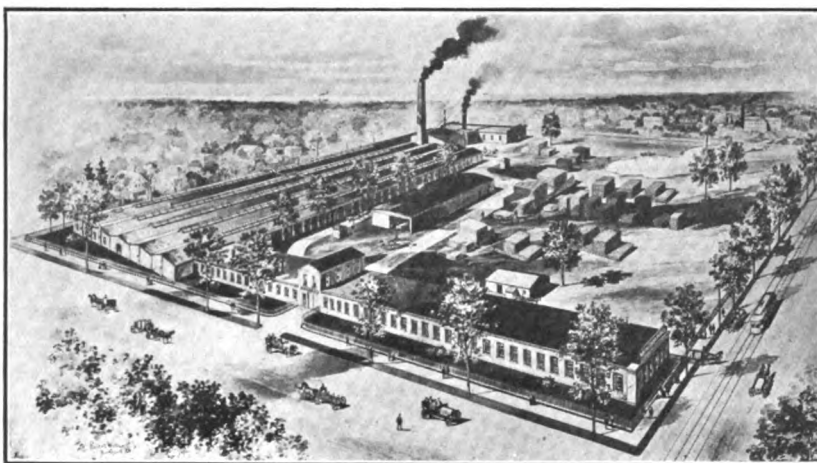
**Chester L. Rieker**, designer of the Henderson car, is interested in a new cyclecar to be known as the **Bicar**. A company will be organized with headquarters in Indianapolis, Ind., to manufacture this product.

**O. G. Temme**, Chicago, Ill., proprietor of the **Triple Action Spring Company**, has recently purchased the entire business of the **Johnson Shock Absorber Company**.

**Arroll-Johnson, Ltd.**, Paisley, Scotland, manufacturer of a popular British car, has placed an order with **Gray & Davis**, Boston, Mass., for a large number of its starting and lighting systems.

The **Palmer-Moore Company**, Syracuse, N. Y., has established agencies in Binghamton, Utica, Auburn, Hudson and Rochester, N. Y., and in Providence, R. I. Plans are now being made to enter Boston and the other New England territory.

The **White Swan Cyclecar Company** is to erect a factory at Marysville, Cal.



The New Plant of Cameron Manufacturing Company in West Haven, Conn.

Cleveland, O.; \$25,000; gears; A. K. Baxter, William H. Frick, Vincent A. Taylor, Oswald M. Hoch, Mrs. Grace Barton.

**Breese Motor Plow Company**, Wapakoneta, O.; \$100,000; to manufacture motor driven vehicles; Robert A. Breese, G. R. Morris, David Lorbach, S. B. Everett, J. A. Hartford.

**Tulite Auto Bulb Company**, Detroit; \$25,000; to manufacture automobile lamps; J. L. Lepper, James M. Richardson.

**Freeport Tungsten Lamp Company**, Hoboken, N. J.; \$100,000; to manufacture lamps; H. J. Jaeger, R. H. Herschman, G. V. Williams.

**Taximeter Register Company**, Washington, D. C.; \$300,000; registers.

**Louisville Automobile Light Controlling Company**, Louisville, Ky.; \$10,000; to manufacture automobile headlights; B. D. Lake, N. G. Marks, James C. Stone, J. G. Harris.

**Flannely-Clarkson Auto Company**, Louisville, Ky.; \$2250; Charles C. Clarkson, T. P. Flannely, E. J. Clarkson, M. H. Flannely.

**Pitts Motor Car Repair and Sales Company**, Brooklyn, N. Y.; \$24,000; Frank G. Pitts, George O. Walbridge and others.

**Ohio Motor Company of Illinois**, Chicago, Ill.; \$5000; vehicles, parts and accessories; Joseph Slottow, Samuel C. Wood, Fred C. Churchill.

**Tanner-Hower Manufacturing Company**, Akron, O.; \$50,000; to sell automobiles; Perry B. Tanner, M. Otis



# NEW DEPARTURE

QUALITY GUARANTEED



AMERICAN MADE FOR AMERICAN TRADE

# BALL BEARINGS

*The* NEW DEPARTURE MFG. CO.  
BRISTOL CONN.



**The United Punctureless Company**, Detroit, has established a branch at 4108 Olive street, St. Louis, Mo., with Adolph Loehr as manager.

**The Pontiac Motor Castings Company**, Pontiac, Mich., is enlarging its building.

**Will H. Brown**, upon assuming his new duties as general sales manager of the Indianapolis branch of the Cole Motor Car Company, announced that the Brown Commercial Car Company will continue business the same as usual with office and service station at 425 North Meridian street, Indianapolis.

**The B. F. Goodrich Company**, Akron, O., has established a Canadian branch at Toronto, Ont.

**The Star Carriage Company**, Seattle, Wash., has started work on the production of the Northwestern one-ton truck. The company is comprised of J. G. Eyer and August Greyerblehl.

**Frederick C. Felker**, Racine, Wis., inventor of a new type of airless tire for automobiles, is planning to engage in the manufacture of this product.

**The Typhoon Signal Company**, Chicago, Ill., has moved its main factory and office to Lincoln, Ill.

**The Fellbach Motor Company**, Milwaukee, Wis., has increased its capital from \$50,000 to \$100,000.

**The Moon Motor Car Company**, St. Louis, Mo., reports an increase in business of 100 per cent. on August shipments, 100 per cent. in September and 100 per cent. in

rooms and a service station for the Imp cyclecar at 1325 Michigan avenue.

**Charles Fredricks**, Denison, Ia., has leased a new building and will open a garage and repair business.

**T. K. Julson**, Dillon, Mont., has erected a 50 by 30 foot addition to his garage, which he will use as a repair shop.

**The Eastern Motor Company**, Atlantic, N. J., has removed to 2720 Atlantic avenue, where three floors are used.

**Charles F. Fulmer**, Plainfield, N. J., who has conducted a repair shop in Sycamore street, has removed to 535 North avenue.

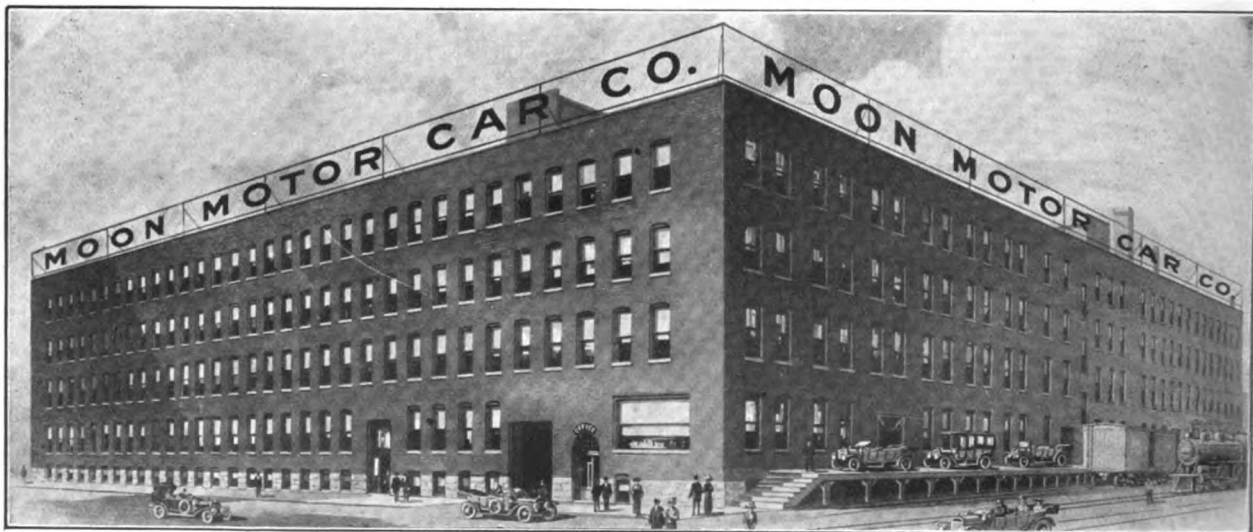
**Robert Hulse**, eastern manager for the Harroun Car-buretor Company, has opened sales and display rooms in the Longacre building, New York City.

**The Haynes Motor Company**, Birmingham, Ala., has just moved into the new service department at 619 South 20th street. The building has been entirely overhauled and modern equipment installed.

**The Ford Motor Company**, Kansas City, Mo., has discontinued the wholesale and retail branch at 1608 Grand avenue. The retail department has been moved to 1710 Grand avenue and the wholesale department to Sheffield, Mo., where the assembly plant is now located.

**The Brockway Motor Sales Corporation** has opened offices at 250 West 54th street, New York City.

**The Actna Garage Company**, Hartford, Conn., has re-



Factory of the Moon Motor Car Company, St. Louis, Mo., Maker of Moon Pleasure Automobiles.

October. This is taken as satisfactory evidence of the decided popularity of the new light weight six-cylinder Moon car announced recently by this concern.

**The Knox-Martin Automobile Company**, Springfield, Mass., is to establish headquarters in Cincinnati, O., for the distribution of the Knox-Martin tractor in southern Ohio, eastern Indiana and central Kentucky.

#### GARAGE AND DEALER.

**The Nashville Motor Car Company**, Nashville, Tenn., has opened a repair shop.

**The Lakewood Auto Supply Company**, Lakewood, N. J., has opened a store at 128 Clinton avenue.

**The Lehigh Valley Motor Company**, Allentown, Penn., has moved to 635 Linden street.

**The Donovan Motor Car Company**, Boston, Mass., has taken over the entire second floor of the Oldsmobile building on Commonwealth avenue.

**The Menshel Tire & Rubber Company**, New York City, has leased new quarters at 1675 Broadway.

**The Lake Auto Agency**, Danbury, Conn., has moved to new and larger quarters in Crosby lane.

**The Mercury Motor Truck Company**, Chicago, Ill., has opened new salesrooms and service station at the corner of 43rd and Halstead streets.

**Paul Wargny & Co.**, Chicago, Ill., has opened sales-

rooms and a service station for the Imp cyclecar at 1325 Michigan avenue.

**The Bradley-Moore Auto Company**, San Marcos, Tex., has moved into its new building.

**The Central Motor Car Company**, Reading, Penn., has opened new salesrooms at 522 Chestnut street.

**The Howe Rubber Company**, New Brunswick, N. J., has opened a state and local salesroom on Capitol avenue, Indianapolis, Ind.

**The Firestone Tire & Rubber Company** of New York has opened a branch at 223 East avenue, Rochester, N. Y.

**The Marathon Automobile Company**, Boston, Mass., has opened new salesrooms at 823 Boylston street.

**Charles E. Riess & Co.**, New York City, is now located in its new salesrooms at 1690 Broadway. The company is showing a complete line of 1914 model Hupmobiles.

**Theodore Crossley**, Riverside, Cal., has had work started on the erection of a new Overland station at 10th and Market streets.

**George A. Bloomfield**, Frankfort, Penn., is to move his business to Salt Lake City, Utah.

**The Chalmers Company**, Los Angeles, Cal., is now located in new quarters on Hope street.

**C. V. Lucius**, Youngstown, O., has moved his business to the Viaduct garage, South Side.

**The Alkire-Smith Automobile Company**, Salt Lake City, Utah, will move to larger quarters on West Temple street, where a new modern building will be erected.



## GENERAL NEWS OF THE INDUSTRY.

### Chicago Electric Motor Car Company Passes into New Hands—Mystery of Saxon Concern in Detroit Is Revealed—Other Organizations and Changes.

**T**HE Carl Electric Vehicle Company, Toledo, O., has purchased the business of the Chicago Electric Motor Car Company, and the equipment will be removed to Toledo. The Carl company was recently incorporated with a capital of \$300,000 and will manufacture electric vehicles. C. A. Neracher, formerly chief engineer for the Willys-Overland company, is one of the principal stockholders in the new organization.

The Chicago company was formed a little more than a year ago by Frederick J. Newman and others, and maintained a factory at 3612-3618 South Morgan street, Chicago, Ill., where electric pleasure cars were produced. It is understood that a business wagon will be added to the line by the new concern.

#### DEALER BECOMES MAKER.

##### Kleiber Company Plans to Build Trucks of Its Own Design.

The Kleiber Company, San Francisco, Cal., which has handled the Gramm trucks for several years, has completed arrangements to manufacture trucks on its own account in San Francisco. The company plans to build 100 of its new machines during the 1914 season, each one of which will be equipped with a Continental engine.

The officers of the new company are: President, Paul Kleiber; vice president, W. M. Remensperger; second vice president, E. Kleiber; treasurer, P. E. Rathjens; secretary, Otto T. Suden.

#### RE-ENTERS THE INDUSTRY.

##### William Mitchell Lewis to Be President of the Lewis Motor Company.

William Mitchell Lewis has actively re-entered the automobile manufacturing field and is to be president of the Lewis Motor Company, Racine Junction, Wis., which has been formed with a capital of \$250,000 to manufacture a car designed by Rene Petard.

Since he retired from the Mitchell-Lewis Motor Company, Racine, Wis., Mr. Mitchell has devoted his time chiefly to his newspaper and other

business interests. Rene Petard was closely associated with Mr. Lewis when with the Mitchell-Lewis company.

#### CHANGES IN SALES FORCE.

##### Woods Motor Vehicle Company Reorganizes This Department of Its Business.

A reorganization of its sales force has been announced this month by the Woods Motor Vehicle Company, Chicago, maker of the Woods electric cars, which should materially strengthen the position of the Woods electric in the field in which it is a pioneer.

The change in the management of this department includes the appointment of H. L. Goodwin as general sales director and W. A. Simonson as general sales manager in personal charge of the distributing agencies throughout the United States. Mr. Goodwin will make his headquarters in the general offices of the company at Chicago, where he will be in complete and intimate touch with all the details of the selling end of the organization.

#### GOES WITH GREEN COMPANY.

##### Melvin J. Adams Becomes Associated with Advertising Concern in Detroit.

Melvin J. Adams has joined the Detroit forces of the Carl M. Green Company, well known in the automobile advertising field. The addition of Mr. Adams should materially increase the efficiency of the service of this company, which has won a prominent position through the handling of the accounts of the Chalmers, General Motors, Detroit electric and other concerns both in and out of the automobile industry, as he has had a wide experience in both newspaper and advertising work.

For two years Mr. Adams was connected with the reportorial staff of the Chicago Tribune, following which he was connected with the United States Motor Company; became advertising manager of the Alco; was with the copy department of the Van Cleve Advertising Agency in New York, and with the Locomobile at Bridgeport, Conn.



### REAPPOINTED AS MANAGER.

#### Well Known Instructor to Head Boston Y. M. C. A. Automobile School Again.

It does not come exactly as a surprise to the many friends of Prof. Winthrop C. Hosford, manager of the Boston Y. M. C. A. automobile school, Boston, Mass., to learn that he has been appointed to this position for another year. Prof. Hosford is a hard worker, but studies continuously, keeping abreast of the improvements and developments of the industry. The reputation of the school, which was the first of its kind to be established in this country, is largely due to his efforts in its behalf.

Born in New Britain, Conn., Prof. Hosford



Prof. W. C. Hosford, Manager, Boston, Y. M. C. A. Automobile School.

entered a machine shop at the age of 16. During the next few years he studied machine drawing and designing evenings. He became identified with the New England Motor Carriage Company in 1898, thus assuming a place among the pioneers of the industry, and has been connected with the motor car field

in some capacity or other ever since that time. For several years he was chief instructor at the Boston Y. M. C. A. automobile school, previous to his promotion to become manager in 1912. Several thousand men—chauffeurs, operators and others connected with the industry in many different capacities—can testify to his skill as a teacher and to his genial personality.

### SAXON MYSTERY CLEARED.

#### Chalmers Officials Interested in Production of New Low Priced Car.

The mystery which has surrounded the recent incorporation of the Saxon Motor Company in

Detroit has been dispelled by the announcement that the concern is composed of nine of the present officials of the Chalmers Motor Company of that city. It is stated that the production of the company will be a new low priced car, with wheelbase of 96 inches and standard tread. It is further explained that it is not to be a cyclecar in any sense of the word, although selling at a price which might compete with that type.

W. H. Ford, secretary of the Chalmers company, is president and general manager of the Saxon concern, and other Chalmers men associated with him are: Hugh Chalmers, Lee Counselman, George Dunham and C. C. Hinkley. The capital stock is placed at \$350,000, with \$100,000 preferred and \$250,000 common. Offices will be maintained at 1305 Bellevue avenue.

### TO MAKE NEW ENGINE.

#### Augustin Rotary Valve Engine Company Will Locate in Marshfield, Wis.

A permanent organization has been perfected by the stockholders of the recently incorporated Augustin Rotary Valve Engine Company, Marshfield, Wis., by the election of the following officers: President, Dr. G. E. Harrington; vice president, Charles K. Herrick; secretary, Henry E. Hoehl; treasurer, R. J. Strauss.

The company was formed for the purpose of manufacturing and developing a new type of internal combustion engine, and a factory has been established at Marshfield, Wis. The incorporators are R. J. Strauss, G. E. Harrington and H. E. Hoerl, and the capital stock is \$10,000.

### NEW CANADIAN CONCERN.

#### Capitalized for \$1,000,000 for the Production of Commercial Vehicles.

The Canadian Bull Tractor Company, Ltd., has been organized in Winnipeg, Man., for the production of motor trucks. The capital stock has been fixed at \$1,000,000, of which only \$200,000 will be issued at present, a later call being contemplated when arrangements are completed for the erection of a factory. The directors have not decided upon a site for the plant, but there is reported to be a strong sentiment in favor of Winnipeg.

The officers of the company are: President, W. H. McWilliams; vice president, A. R. Hargraft; secretary and treasurer, J. S. Loudon; directors, W. J. Cummings, Roy M. Wolbin, Walter Pace, L. A. Cannon and H. F. Williams.



## THE GLIDDEN TROPHY METZ MODEL.

**B**ECAUSE of its especially good work in winning the 1913 Glidden trophy event, in competition with many cars of greater power and higher price, the 22 horsepower Metz roadster, made by the Metz Company, Waltham, Mass., has come very prominently before the public during the past few months. The design will be continued, without material change, throughout the coming season.

The motor is a four-cylinder unit, cast en bloc, with removable water jacketed cylinder head. The bore is 3.75 inches and the stroke four, giving a standard rating of 22.5 horsepower. The crankshaft is made of high grade steel, specially heat treated, and has three main bearings with long bearing surface. The lower half of the crankcase constitutes the oil reservoir. The valves, pushrods and springs are completely enclosed, making for noiseless operation and excluding dust and grit.

Cooling is by thermo-syphon, and the radiator is of ample size. Lubrication is by constant level splash, operated by pump.

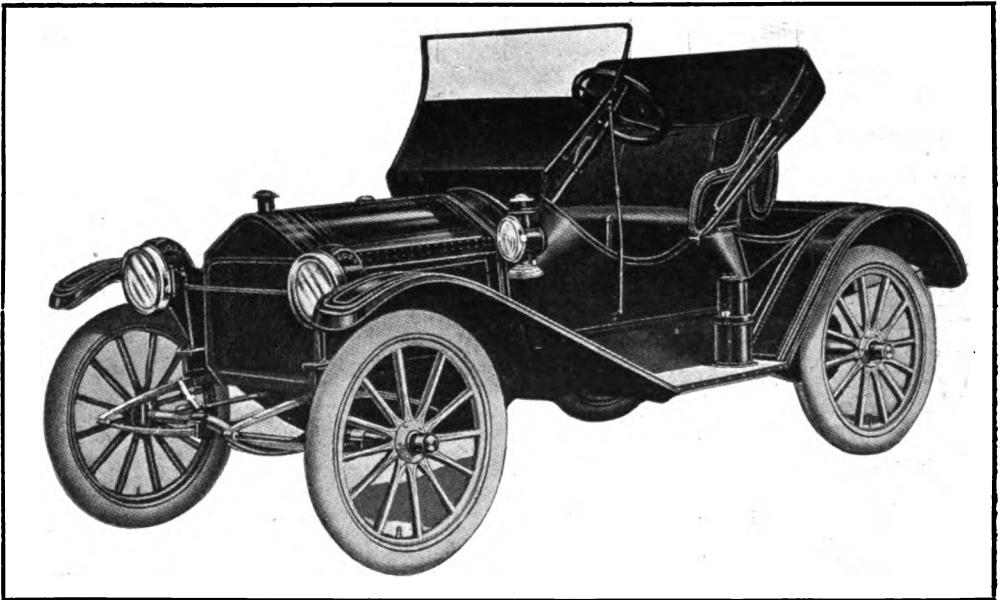
The carburetor is a float feed automatic type of standard make. Ignition is by high tension Bosch magneto. The fuel tank is at the rear and has capacity of seven gallons.

One of the distinctive features of the Metz is the friction transmission. The friction rim is composed of compressed fibre, and the driving plate is of special alloy. The propeller shaft from the engine to the fibre disc is mounted on ball bearings of large dimensions, and forms a straight line drive from the motor to the jackshaft. Final drive is by chains running in oil.

The springs are full elliptic, heat treated, and carefully selected as to tension and weight. The frame is of pressed steel channel section. The wheels are of the standard artillery type, fitted with Goodrich 30 by three-inch clincher tires.

One set of internal expanding brakes operates on rear wheel drums, while an external contracting brake is located on the jackshaft. Of course, the friction transmission may be used as a brake in an emergency. The driver is placed at the left with control lever in the centre of the car. This latter is of steel tubing with a cap on the top, which, when pressed down, permits of shifting to any speed desired. The wheelbase is 90 inches and tread standard.

The body is described as of the semi-enclosed type, a modification of the fore door design, with seating capacity for two persons. The rear deck affords space for luggage, etc. The equipment



The Friction Driven, 22 Horsepower Metz Roadster—Winner of the Glidden Trophy.

includes a top, windshield, removable side curtains, gas lamps and generator, horn, tire pump and full set of tools.

Ninety-five per cent. of the parts comprising the Metz cars, including practically every component but the tires, magneto and carburetor, is made at the plant of the Metz Company in Waltham. In addition to the model described, it is understood that the company is practically ready to market a speedster design, having the same chassis details, but with an open body of racy appearance and equipped with wire wheels, electric lighting and motor starter. This will be sold at a slight advance in price over the regulation model. It is also stated that the electric lighting and starter may be secured for the older design as well as extra equipment.



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## What the Ford Company Says

See Ford Model T Instruction Book, Page 30 (Sixth Edition).

"When the motor overheats and the water boils many car owners are only too ready to blame it to insufficient water capacity, when really the water capacity is ample and the difficulty is due to some outside influence."

### That ought to be proof enough for you that your Ford should not overheat

If the "Outside Influences" are properly adjusted the regular Ford equipment will keep your car cool without recourse to expensive alterations.

The Ford Special Boyce Motometer will enable you to adjust your carburetor properly and thus obtain maximum efficiency and mileage.

It will enable you to carry your spark at the right point.

It will tell you when to fill the radiator.

It will record when to tighten the fan belt.

It will enable you to regulate these "outside influences" correctly and scientifically, AND it will absolutely act as an oil gauge preventing scored cylinders, warped piston rings and burned bearings.

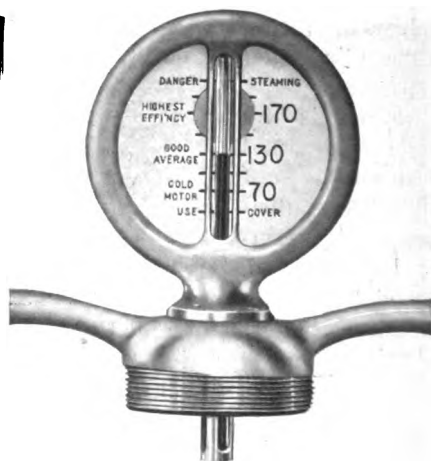
The Ford Special Boyce Motometer is here announced for the first time. Our standard instrument is in use as standard equipment on such cars as Mercer, Pilot, Henderson and is used by 91% of the world's greatest racing drivers.

The Ford Special Motometer requires no fitting or drilling. You simply unscrew your cap and replace with the Ford Special Motometer with cap. This instrument will be sent you prepaid on receipt of price--\$5.50--together with full instructions for operation.

**30 DAY TRIAL OFFER.** If at the end of thirty days you are not entirely satisfied with the Motometer return it to us and we will gladly refund your money. **WRITE FOR AGENTS' PROPOSITION.**

## The Motometer Company, 1790 Broadway, New York City

When Writing to Advertisers, Please Mention The Automobile Journal.



View From Seat

**FORD SPECIAL  
BOYCE**

**MOTOMETER**

**PRICE \$5.50**

Remove your cap and substitute this cap and the work of attachment is complete.



# FORD SPECIALTIES

## FORD HOOD AND RADIATOR COVER

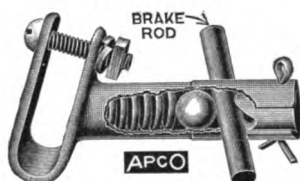
Made from heavy rubber cloth, heavily padded and as a winter necessity it takes the lead. Keeps in the heat and keeps out the cold. Your car will start easy in cold weather and the snow and sleet will not go through the hood and on the spark plugs. The price is low when you consider the quality and you must have quality or you have nothing.

**Price \$5.00**



## EMERGENCY BRAKE ROD SUPPORT

Pat. Pending



This is one of the most necessary devices we have ever offered. Takes the place of the steel supports now on the Ford. Keeps the rods from vibrating. Put on in half an hour. Made from bronze. Guaranteed for life.

**Price per pair \$2.00**

## Ford Brake Shoes



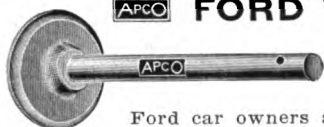
Made in two qualities, manganese bronze and gray iron. The workmanship is good and they are guaranteed to fit. Set includes four pieces.

**Prices:**

**Bronze \$2.50**

**Iron \$1.00**

## FORD VALVES



Absolutely a better valve than has ever been offered to Ford car owners and at a price no higher than the cheap kinds.

**Price each . . . . . 30 cents**

## PRIMING PLUG

It is a well known fact that there is no way of priming the Ford cylinder without removing the plugs and the APCO Priming Plug is designed to furnish an easy means of doing so. The big trouble with the ordinary priming plug is that the quality of the spark plug itself is overlooked and we have taken our regular APCO spark plug that met with such success last year and installed a priming device in it without impairing its sparking qualities. APCO priming plugs insure clean contact points, clean cylinders and easy starting in any temperature. There is a lot to be said about the need of a priming plug in the Ford, but every Ford owner knows the need and we can supply the goods.

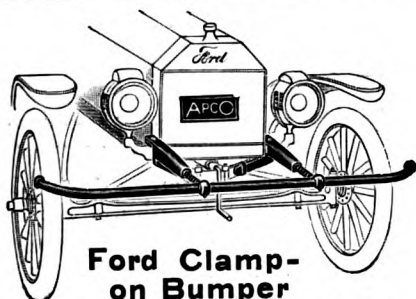
**Price each . . . . . \$1.00**



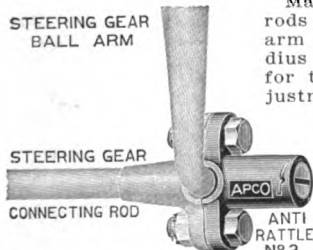
## Ford Clamp-on Bumper

Made from high grade material. Put on in an hour. No machine work necessary. Black enameled finish. Changes the looks of the car.

**Price . . . . . \$4.50**



## Anti-Rattling Ball Socket Caps



Made in three styles, two for the radius rods and one for the steering gear ball arm (shown in cut). Our No. 1 is for radius rod and has screw adjustment. No. 2 for the same purpose, but with disc adjustment. No. 3 (shown in cut) for steering gear ball arms. These devices are the best sellers in our entire line and no Ford should run without this equipment.

**Prices Each: No. 1, \$1.50  
No. 2, \$1.00 No. 3, \$1.00  
(Two required on car.)**

## FORD HUB CAPS



Made exactly the same as the ones furnished on the Ford car. Made from high grade heavy gauge brass, highly polished.

**Price each 30c**

THE LARGEST FORD SPECIALTIES MANUFACTURERS IN THE WORLD

# AUTO PARTS COMPANY

PROVIDENCE RHODE ISLAND

APCO APCC APCO APCO APCC APCO APCO APCO APCO APCO APCO



## OVERHAULING THE FORD CHASSIS.

### Outlining the Components Requiring Attention and Suggestions for Cleaning and Adjusting---Timing and Wiring Diagrams---Special Tools Necessary.

**T**O OBTAIN maximum efficiency from the used model T Ford car in winter service it should be given a thorough inspection, the extent

ating the speeds and clutch must be in a certain position before the cover with pedals can be replaced.

#### Tools and Supplies Required.

There are a number of special tools which will be required in the complete overhaul of the chassis, among which may be named: A cam gear puller, transmission clutch puller, rear axle housing bolt nut wrench, valve seat reamer, crankcase bolt and nut wrench, etc. These may be obtained from the factory or purchased from concerns specializing on the Ford car. Some of the special tools named above will not be necessary unless certain parts are damaged and require replacement, such as the timing gear, for example. A practical set of special tools may be obtained at a reasonable cost and, supplemented with the average tool equipment, should suffice. The amount of supplies needed will depend largely on the work, and the owner will have to be guided by conditions. As the majority of supply houses carry Ford material, it will be a simple matter to purchase as needed.

#### Preparing for the Overhaul.

It is advisable before beginning the work of the overhaul to strip the machine of all accessories, such as lamps, generator, etc., and, if any need repairing, have the work done while the chassis is being given attention. Clean the motor, transmission housing and all other components which are covered with grease and oil, with gasoline. A stiff brush will serve if the garage

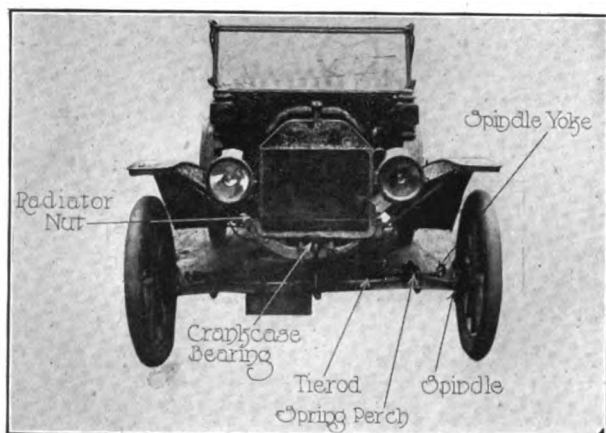


Fig. 1—Components Requiring Inspection in the Overhaul of the Chassis.

of which will depend upon the age of the machine, its condition, etc. It is possible that, aside from removing carbon, grinding in the valves, taking up the bearings, and making a few minor adjustments, the chassis may be prepared for the road. On the other hand, if the machine has seen considerable service, it will be advisable to make a complete overhaul. In planning the work the owner will find it to his advantage to study carefully the instruction book issued by the maker, familiarizing himself with the construction details. The parts catalogue, showing as it does each component of the chassis, will be valuable in disassembling and assembling.

#### Extent of the Overhaul.

The amount of work that may be done by the owner will depend to a great extent upon his knowledge of the mechanical construction of the car. There are several units which require experience to reassemble, the transmission, for example. While it is a simple matter to displace the transmission cover, which can be removed in approximately 30 minutes by the expert familiar with the Ford, it is likely to take the novice at least half a day. This may appear to be an extravagant statement, but a study of the transmission and its cover will reveal the difficulties to be encountered by the amateur. In further explanation it may be stated that the mechanism oper-



Fig. 2—Showing Members to Be Disconnected Before Attempting to Remove the Power Plant.



is not equipped with a compressed air cleaner. Next, wash the body and running gear. Before displacing the radiator, empty it and fill with a solution of common washing soda and water, or a marketed preparation for this work. Operate the motor for a few minutes to allow the solution to dislodge any rust, etc., that may have accumulated through not changing the water from time to time. If the water is badly discolored, repeat the treatment, after which refill with fresh fluid and run the engine.

Drain all water from the cooling system and then remove the clamps of the intake and outlet water pipes, taking care not to bend or break these retainers. Remove the rubber piping, inspecting same for loose fabric, and make a note if new is needed. The rods supporting the windshield are removed at the radiator and the latter may be displaced by removing two nuts as indicated at Fig. 1. It is assumed that the hood has been taken off and the tierod connecting with

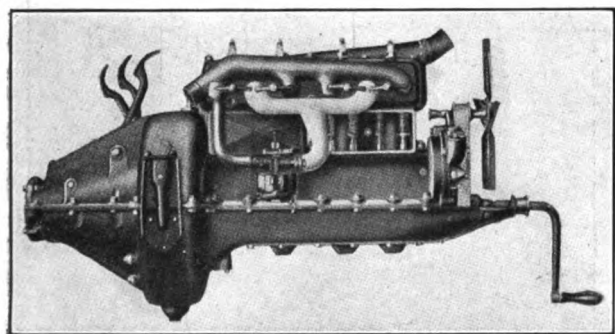


Fig. 3—By Removing the Motor the Work of Inspection, Adjustment, Etc., is Greatly Simplified.

the dash unscrewed from the cooler. In handling the radiator care should be taken not to impose stresses upon the fins or tubes. If it has been leaking it may be sent to the expert or repaired by using a radiator compound.

#### Stripping the Motor.

The illustration at Fig. 2 will be of service in stripping the motor. Disconnect the wires at the spark plugs, also the primary leads at the timer. The last named should be tagged if the wires are dirty, as it will simplify the replacement. Otherwise, each wire will have to be tested. In marking the primary wires the drawing at Fig. 13 will be of value, showing as it does the direction of rotation and firing order. Disconnect the rod leading from the dash to the needle valve of the carburetor by screwing it out. Next disconnect the union of the fuel supply pipe at the carburetor, but first close the petcock at the tank. The spark plugs, intake and exhaust

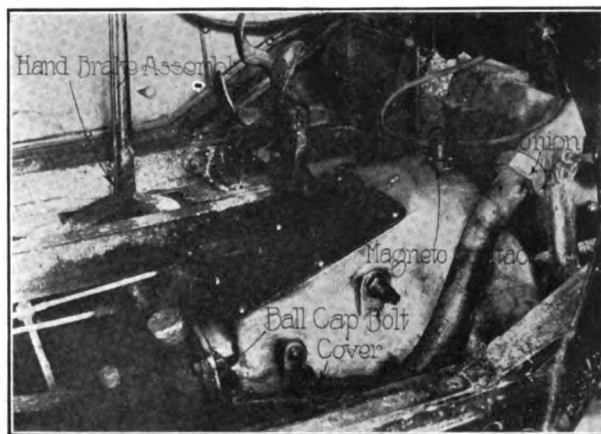


Fig. 4—Before Taking Out the Power Plant, Disconnect Nuts and Bolts of Universal Joint Ball Cap.

manifold may be removed or left as is desired.

Before attempting to remove the motor, disconnect the cable at the magneto terminal and the union connecting the exhaust manifold with the exhaust pipe. These components are shown at Fig. 4. It will also be noted that the universal end of the drive shaft is retained by a ball cap, and the latter by nuts and bolts. If the rear construction is to receive attention, it is best to displace this before removing the motor. Disconnect the emergency brake rods and chock the front wheels securely, both front and back. Next, disconnect the rear spring retainer and jack up the frame and body so as to permit the withdrawal of the rear assembly; that is, so that the rear axle will clear. If the universal ball cap be clear the rear construction can be rolled out from the car, and the slip joint should separate from the transmission shaft easily. Block up the rear of the frame so that it will be steady when displacing the motor.

The motor is suspended at three points, one

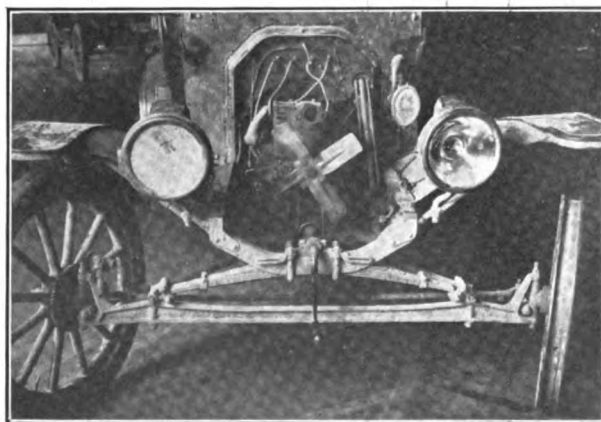
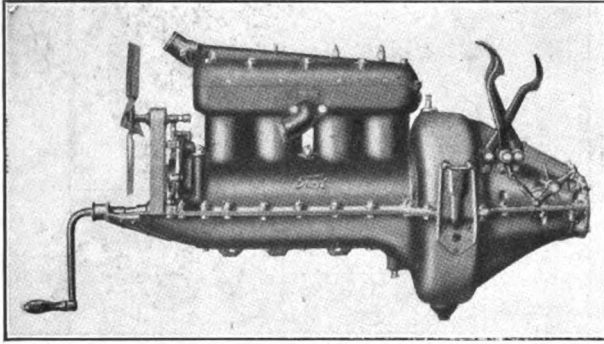


Fig. 5—Showing Radiator and Connections Displaced, and Front Bearing of Motor.



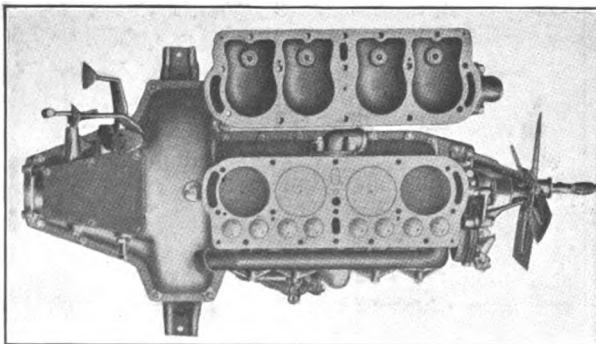


**Fig. 6—Intake Side of Motor, Showing Frame Supports Which Should Be Inspected for Loose Rivets—These May Require Brasing.**

on either side of the transmission housing and at the front as shown at Fig. 1. Examine the bolts for wear. Remove the crankcase front bearing cap and inspect the frame bearing, also rear supports, as these may be loose and require tightening because of worn rivets. The Ford motor differs from conventional practise in that the lower crankcase is not removed with the cylinders. The latter are bolted and the bolts may be displaced easily with a special wrench, although the work may be accomplished with ordinary tools.

Before attempting to lift out the motor, make sure that all connections are loose. It will be an easy matter to take out the power plant with the assistance of one person. An important point to be observed in the work is the flywheel generator. As this is incorporated with the flywheel and practically with the motor, care must be taken not to injure the windings and their connectors. After lifting the motor from the frame, place it on its side. This will insure that the generator will not become damaged, and permit of working on the bearings, etc.

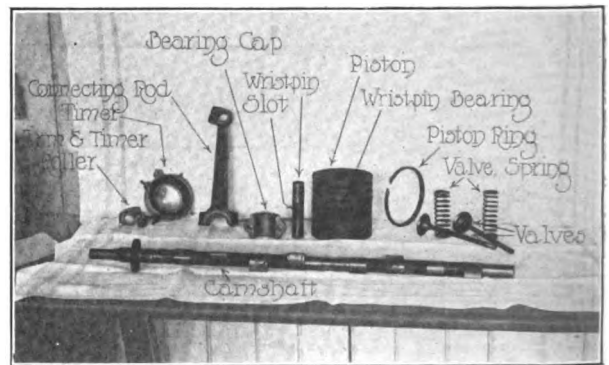
With the engine on its side, remove the spark plugs and valve cover plates. Next, take off the cylinder head and endeavor to remove the gas-



**Fig. 7—Motor with Cylinder Head Displaced, Permitting of Easy Access to Pistons, Valves, Etc.**

ket without injury. The exhaust and intake manifolds are retained by clamps or stirrups and these held by nuts. Place them on the work bench for cleaning with their gaskets. The fan bracket may be left on the motor if desired, it being assumed that the belt has been previously loosened by means of the adjusting mechanism to permit of displacing the motor.

If the overhaul requires the scraping in of the bearings, the timing gear plate must be removed in order that the gears may be correctly remeshed. Examine the timing and crankshaft gear to note if the teeth are marked as indicated at E, Fig. 12. If not, prick punch them as shown in the sketch. Before attempting to remove the camshaft and crankshaft, the bearing caps of these members must be prick punched so that they will not become mixed in the reassembly. Mark the centres of the main bearing caps 1, 2, 3, respectively, also one side, to insure correct re-



**Fig. 8—Components of the Motor, Requiring Careful Examination—Also Showing Slotted Wristpin and Its Bushed Bearing.**

placement. This precaution is very necessary.

An examination of the bearings will determine whether they need scraping or adjusting. Smear the shaft with Prussian blue, clamp down the cap and rotate the crankshaft. Begin with the rear bearing and observe if the blue indicates a full bearing. If not, the babbitt must be scraped and the cap refitted until a good seat is obtained. The second and third main bearings are treated in a like manner. In adjusting the bearings they should be set up snugly. Some advise a degree of tightness permitting of rotating the shaft with one hand, while others recommend a closer fit. Before replacing the caps, clean and lubricate the shaft and caps. It is possible that the caps will have to be reduced to obtain a good bearing. Do not use a file, but place emery cloth on a smooth board or surface plate which will insure accuracy. The camshaft bearings are treated in a similar manner, but it will first be necessary to



remove the valves to get at these members.

Assuming that the overhaul of the motor is to include the scraping in of the large ends of the connecting rods, it will be a simple matter to disconnect the bearings, but mark the caps as were the main bearing members, else considerable trouble will be experienced in the reassembly. The connecting rod bearings are of the split type, as shown at Fig. 8. After removing the caps it will be an easy matter to push the rod and piston out of the cylinder. It is also suggested that the connecting rods be prick punched 1, 2, 3, 4. This will insure proper replacement.

The piston rings should be displaced to clean all carbon from the piston, and in performing this work care must be exercised, else the rings will be broken. Slip three strips of tin or old hacksaw blades between the top ring and piston and it will be found that the ring will slide off easily.

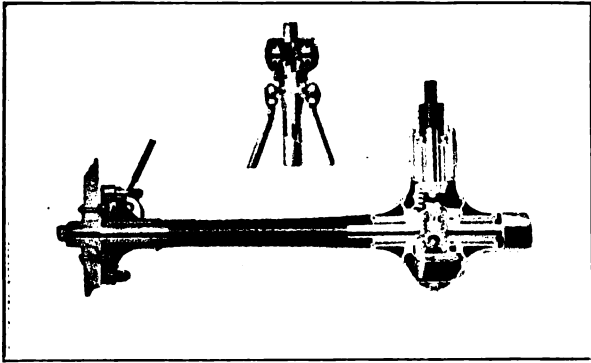


Fig. 9—Sectional View of Rear Axle—Smaller Illustration Depicts How Radius Rods Are Retained and Adjusted.

Remove the others in order and place them so that they will go back in the same order.

The wristpin oscillates in a bronze bushing in the piston bosses as shown at Fig. 8, and is consequently clamped in the small end of the connecting rod. It is provided with a slot to prevent its turning and the bolt must be set up tightly in the reassembly. If the piston bushing is worn a new one will have to be fitted to eliminate the play, and this will require the use of a special reamer. It is possible that both the bushing and new wristpin will be necessary to complete a satisfactory repair.

#### Inspection of Valves.

The valves are removed by compressing the springs, for which a valve lifter will be required. Mark the valves in order, and after scraping off all carbon, grind them in, using any good valve grinding compound. Be careful to remove all traces of the abrasive, and in replacing the valves smear the stems with a mixture of graphite and

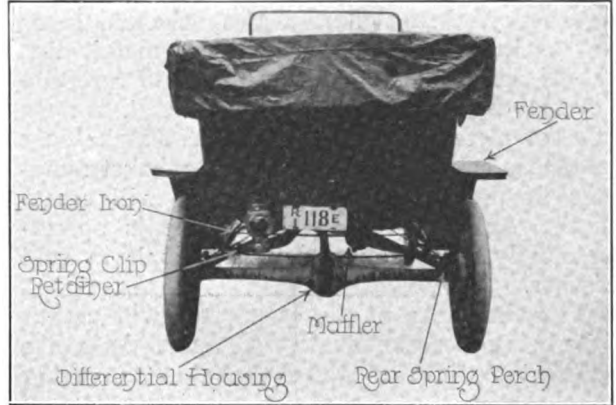


Fig. 10—Components of Rear Construction Which Should Not Be Overlooked in the Overhaul.

oil. It is assumed that all carbon deposits have been cleaned from the cylinder and piston heads, and the writer recommends the smearing of these with graphite, which will resist the formation of carbon.

The exterior components of the motor may be fitted before or after replacing the power plant, as convenient. The work of putting back the pistons may bother the novice, but by using a clamp device or tying the rings in place, and proceeding carefully, the result should be satisfactory. It is important that the connecting rods face the same way as when removed and for this reason the marking above referred to was suggested. In replacing the bearing caps, the fit should be so that the piston and rod will barely turn of their own weight. These bearings should be well cleaned and lubricated.

#### Cleaning Crankcase.

The crankcase ought to be cleaned and flushed with kerosene or gasoline before replac-

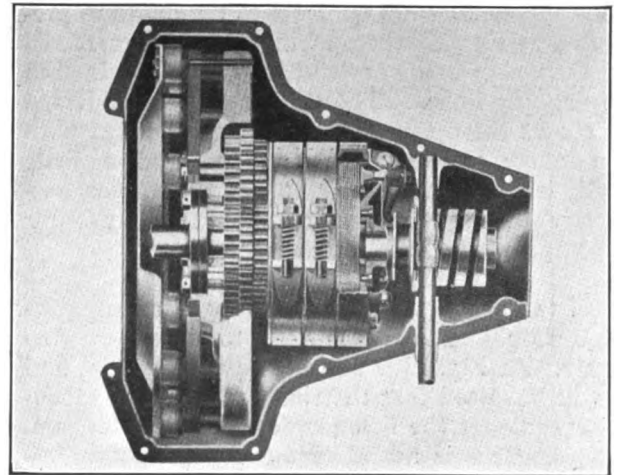


Fig. 11—Transmission with Cover Removed—Its Overhaul Will Require the Services of an Expert.



ing the cylinders. Throw away the old lubricant as it may contain particles of metal, dirt, etc. If the gaskets have been taken off carefully they may be used again, but, if doubtful, fit new, as a complete set is not expensive. Make sure that those between the intake and exhaust manifolds fit properly, as auxiliary air will create trouble, especially when the engine is operating slowly, and make starting difficult in cold weather.

The simplicity of the carburetor will permit of its being disassembled and cleaned. It is also an excellent idea to clean the pipe conveying heated air to the intake. Examine the float of the carburetor, as it may need shellacking. It may be tested by pouring gasoline in the float and noting its position.

With the motor in the frame, proceed to check up the valve timing. The valves of the Ford are

first and second timer leads are connected to similar primary terminals of the coil, but the third contact to be made in order by the roller of the timer is connected by wire to the fourth terminal of the coil. The cylinder firing last is the No. 3. The secondary wires are fitted in the same manner; that is, the firing order is observed.

Relative to the timer: If this member is worn, it is best to replace with a new one, as they are inexpensive. The cost of repairing the old one would doubtless exceed that of the new. It is a simple matter to replace a timer: Place the piston of the first cylinder (that nearest the radiator) on top dead centre, or compression. It will be found that the hole in the camshaft will register with that of the timer when the spark lever is retarded and the rod is connected to the commutator. Lubricate the timer before fitting, or if the old one is utilized, clean it with gasoline.

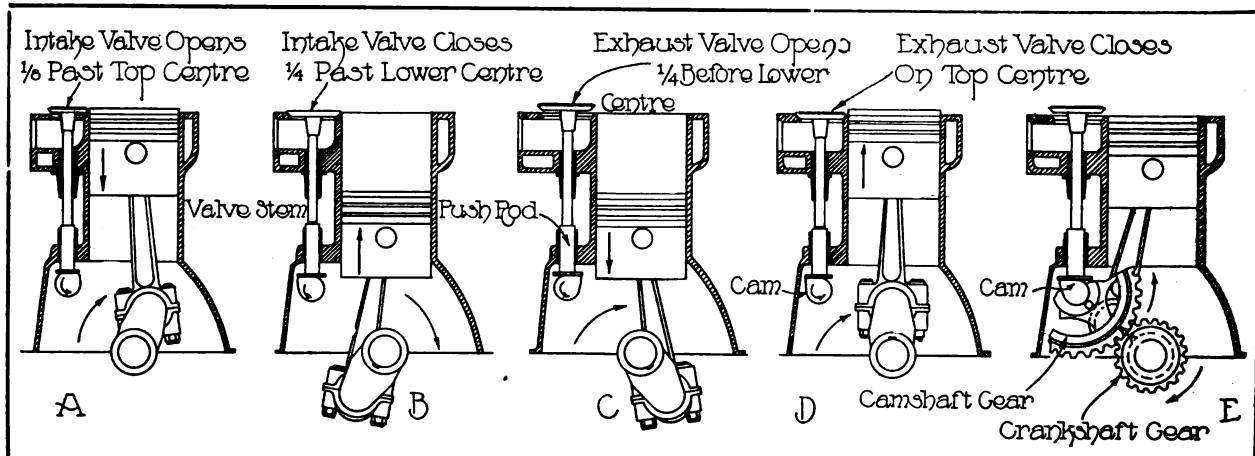


Fig. 12—Diagrams Showing Method of Retiming the Valves and Proper Method of Replacing Camshaft—The Opening and Closing Points of Valves Are Also Outlined.

not adjustable, but if the space between the stems and tappets does not conform to the diagram presented at Fig. 12, the openings may be corrected by the use of adjusters which may be obtained at any supply house. The timing diagram referred to shows the opening and closing points of both the intake and exhaust members, and a little study should enable one to set the valves correctly. A slight allowance should be made for the expansion of the metal when heated.

#### Rewiring Motor.

If the primary wires were tagged as suggested, it should be a simple matter to place these correctly. At Fig. 13 is shown the wiring plan, and it will be noted that the timer rotates anti-clockwise and that the firing order of the motor is 1, 2, 4, 3. This is not always taken into consideration by the owner making his first overhaul. By studying the wiring plan it will be seen that the

The disassembly of the rear axle will require care. A semi-sectional view is presented at Fig. 9, the smaller illustration showing how the radius rods are secured to the drive shaft housing. If the drive shaft is to be displaced, the nuts of the front ends of radius rods and those of the studs holding the shaft tube must be taken off. This will permit of removing the tube, shaft, etc., but, unless one is familiar with the construction, any repairs needed are best left to the expert, for in replacing the parts one is likely to so adjust the radius rods as to cause misalignment. While the instruction book of the maker gives in detail the operations necessary for this work, as well as for the disassembly and replacement of the differential, it is best to have the assistance of some experienced person. Ordinarily, the rear construction will not require any attention other than removing the old lubricant and replacing with new.



The same holds true of the transmission, except that the different speeds can be adjusted by the novice.

### Steering Gear and Linkage.

The inspection and overhaul of the steering gear and its linkage is important. Lost motion may be due to wear of the spindle bushing or pin, tierod, yokes, etc. These components are equipped with bushings which, if badly worn, may be driven out and replaced with new. In connection with this work it generally is necessary to ream the bushings to secure a fit, and a special reamer will be required if accurate work is to be obtained. Lost motion in the ball and socket members can be eliminated by filing the caps, but a better method is to fit the anti-rattlers marketed for these parts. The ball and socket of the front radius rod is subject to wear and as an anti-rattler with adjustable features

### Adjusting Ball Bearings.

Before lowering the jacks, unscrew the hub caps and inspect the ball bearings. These are of the cone and cup type, and should be carefully examined for wear and replaced with new if not in good condition. If one or more of the balls are worn or pitted, replace with a new set, packing the spheres in a good quality of grease, one free from acid, and readjust. Take up on the nut until the wheel binds, then slack off about half a turn and lock the nut. The wheel should spin freely, but if on slowing down it shows a tendency to bind at one point, examination of the spindle should be made. It will probably be found out of true.

### Care of Brakes.

Next to the steering mechanism, the brakes are of importance. The service member is operated by the foot, and this with the low speed band

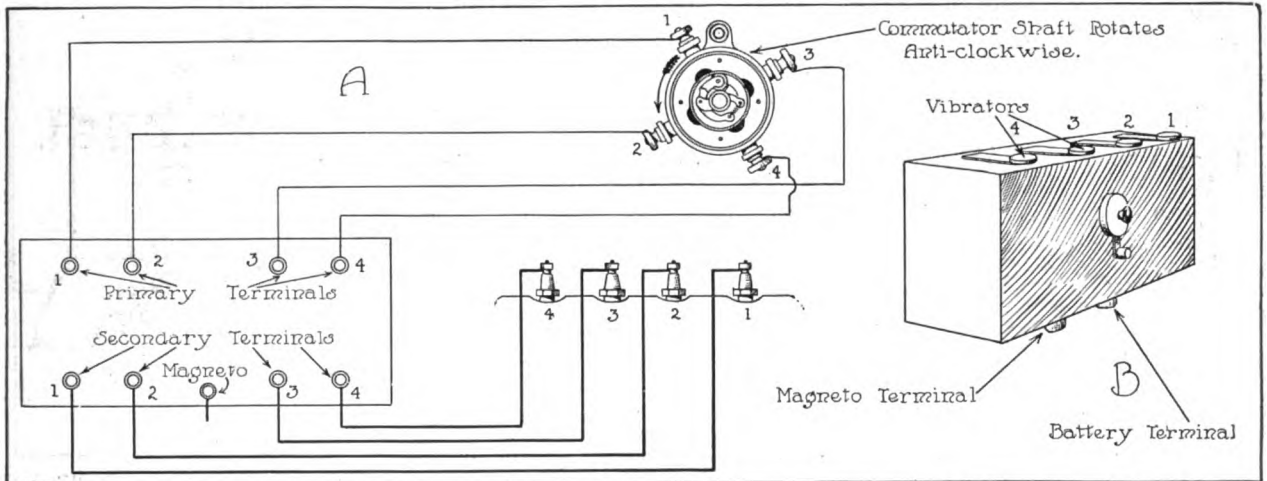


Fig. 13—Wiring Plan of Both Primary and Secondary Circuits—It Will Be Noted That Timer Roller Rotates Anti-Clockwise When Viewed from the Front.

may be procured for a small sum, its use is to be preferred to the filing process referred to.

The steering gears proper are of the planetary type and are located in a small housing under the wheel. They are accessible for inspection and lubrication by loosening a set screw and unscrewing a knurled brass cap, first removing the wheel which is retained by a nut and key. If the gears are badly worn it may be necessary to replace with new, but this is an exception rather than the rule with this type of steering gear.

In testing for lost motion in the steering mechanism it is suggested that both of the front wheels be jacked up, and this method will permit of trying all linkage for freedom of movement. In inspecting the steering gear and its components it is well to clean the lubricating cups and refill with oil.

may need relining. They are accessible through the cover plate of the transmission. Rotate the clutch band adjusting nuts B and C, Fig. 14, to the extreme ends of their shafts, then remove the low speed band adjusting screw A. Displace bolts retaining the cover and, holding the slow speed pedal, lift the assembly. Slip the bands forward, sliding that nearest the flywheel over the first of the triple gears. Next, rotate the flywheel until the openings in the bands are down, when it may be lifted out. To accomplish this, it is necessary to spread apart the bands at the ears, and this is more easily done if the three sets of triple gears are so placed that one set is about 10 degrees to the right of the centre at the top. To replace, reverse the procedure, but in fitting the transmission cover see that the clutch release ring fits into the rear groove of the clutch shaft.



This is shown in the illustration at Fig. 11.

The emergency brake shoes may be obtained at the majority of supply houses and are of metal.

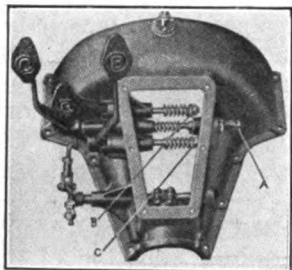


Fig. 14—Transmission Cover.

To remove the rear wheels a puller will be needed, but these are inexpensive and should be included in the tool equipment. In the overhaul of the chassis the muffler should not be overlooked. It may be disassembled and cleaned by taking off the nuts holding the rods in

place. Smear the threads with graphite.

If the rear system has been removed for any cause, in replacing it some trouble may be encountered in fitting the squared tongue of the universal joint into the transmission shaft. With the assistance of one person to steady the shaft housing, the workman can guide the tongue so that it will enter the squared section of the shaft.

Both the front and rear spring perches should be gone over and inspected for undue wear, also the spring retainers and clips. The perches are bushed and sometimes a new bushing will reduce lost motion, but if considerable wear is noted the bolts will have to be renewed. These components require lubrication. It is also suggested that after the overhaul and before the car is tried out on the road, all nuts and bolts be gone over, and tightened. This plan is recommended even after the chassis has been tested out for it will generally be found that several are loose.

Before starting the motor and, especially if

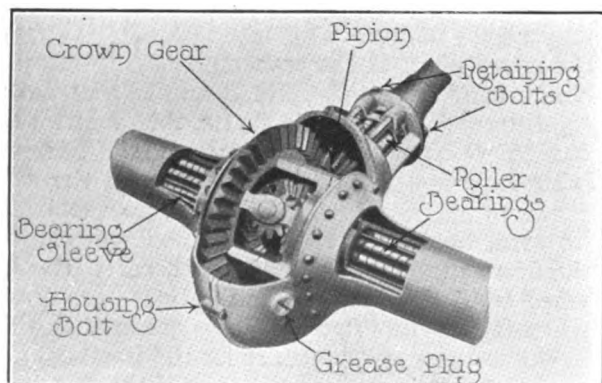


Fig. 15—Section of Differential Housing Cut Away to Show Grouping of Components.

the bearings have been taken up, make sure that there is plenty of oil in the crankcase and the radiator is filled with water. Run the motor slow-

ly at first and at intervals, until the bearings are well worked in. The matter of adjusting the low, reverse and high speeds is familiar to the owner, and the same is true of the brakes. If new shoes have been fitted to the rear wheels it is suggested that the brake drums be examined after a short run to note if they are heating. If such be the case, remove the wheels or examine the adjustment of the rods as the drums should not heat. With the shoes dragging the efficiency of the motor is impaired.

It will generally be found, after the road test, that there are a number of minor adjustments to be made, such as setting the carburetor, adjusting the vibrators, brakes, etc. The matter of tires and rims has not been discussed, having been dealt with fully elsewhere in this issue. While it is admitted that the novice will encounter ob-

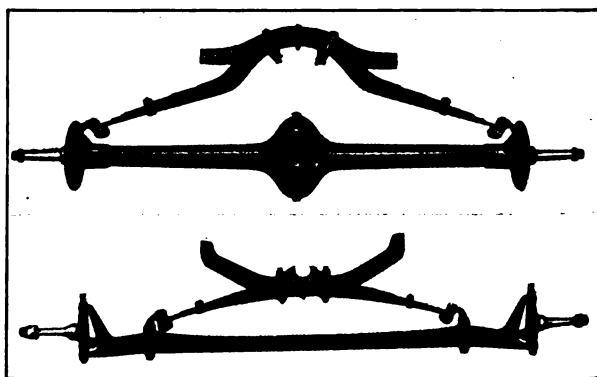


Fig. 16—Front and Rear Spring Assembly—The Lower View Shows Cones and Adjusting Parts of Ball Bearings.

stacles in the overhaul, the experience gained will be of distinct value in that it will teach him to properly care for his machine in service.

### BOOTH FELT GASKETS.

In overhauling the Ford motor, too much emphasis cannot be laid upon the importance of proper gaskets and their use. One of the most important points to observe in reassembling the motor is the placing of the gasket between the upper and lower crankcase. This should be fitted with a gasket that will be absolutely tight, for if any leaks exist the lubricant will be forced out by the crankcase compression, and the loss of oil will result in burned connecting rod and main bearings.

N. E. Booth, 644 Pacific street, Brooklyn, N. Y., specializes in felt washers and gaskets, and produces a complete assortment for the model T Ford motor, etc., and these come ready for at-



tachment. They are made accurately to size so that no trouble is experienced in fitting the gaskets to the parts, a difficulty usually encountered

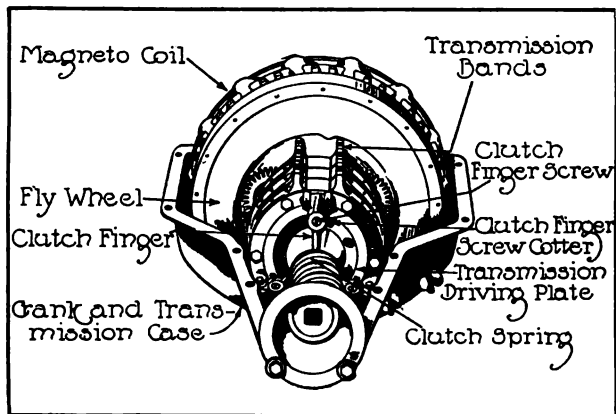


Fig. 17—Illustrating Parts Utilized in Adjusting the High, Low and Reverse Speeds—This Is Possible Without Removing Large Transmission Cover.

with home made members. All bolt holes, etc., align perfectly. The Booth gaskets are well known to the industry and felt presents many advantages, among which may be named that of permitting parts not in line to be drawn up and made tight without danger of breaking the members. The maker of Booth gaskets will submit samples to the trade and invites correspondence from the owner overhauling his car. Gaskets are also made for standard purposes.

### HUPP HAS BIG YEAR.

J. Walter Drake, president of the Hupp Motor Car Company, Detroit, in discussing the automobile business, recently brought to light some very interesting facts concerning his company. He said that last August the Hupp company closed the biggest year in its history. The receipt of orders for immediate shipment since Sept. 1 has broken all previous records, and the winter production, which ordinarily falls off on account of a lighter demand, now amounts to the pro rata daily output for the entire year and the daily shipments are up to the same mark.

### NINE NEW FACTORY BRANCHES.

The Stewart-Warner Speedometer Corporation, Chicago, Ill., maker of Stewart and Warner speedometers, has recently opened nine new direct factory branches in the following cities: Philadelphia, Pittsburg, Atlanta, Portland, Los Angeles, Kansas City, Minneapolis, Cincinnati and St. Louis. This brings the total to 17.

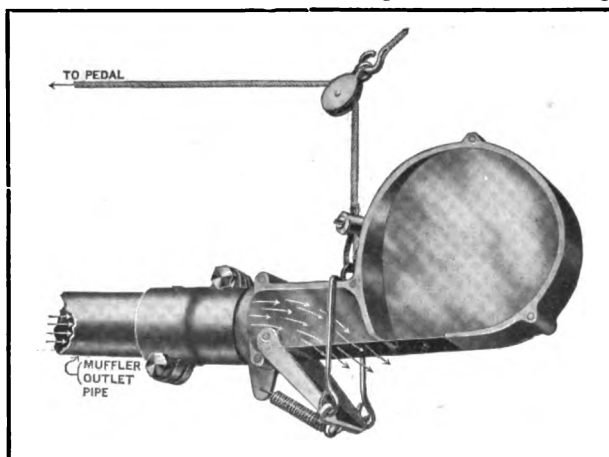
### JERICO HORNS.

The selection of a signalling device requires careful consideration, in that it must be efficient as well as ready for service when required. The exhaust type is favored by many owners, as the only expense involved is the original cost. Another quality is that being operated by the waste gases of the motor there is no expense attached to its upkeep.

The Randall-Faichney Company, Jamaica Plain, Boston, maker of the well known B-line grease guns, is marketing the Jericho horn shown in an accompanying illustration, and this is operated by the exhaust. It is fitted easily over the pipe extending from the muffler, as a special clamp is incorporated, one requiring no cutting or alterations. The maker points out that the Jericho may be attached by the most inexperienced in a few minutes and correctly.

The Randall-Faichney Company also is featuring the Blitz spark plug, which is stated to be the only construction having a mica wound sleeve completely encased in porcelain. One of the qualities of the plug is the use of large electrodes. It is simply constructed and is designed for all types of motors. It is claimed that the breaking or cracking of the porcelain will not short circuit the plug.

The Randall-Faichney Company is also marketing the Jericho motorcycle horn, which embodies the same quality of workmanship, material and efficiency as the Jubilee and Jericho horns made by this concern for automobile use. It is attached to the exhaust pipe between the motor and the muffler, the operation involving



Jericho Horn, Operated by the Exhaust and Easily Attached to Any Type of Standard Make of Car.

but little labor. Suitable fittings are supplied with the Jericho motorcycle horn, which is operated by a metal cable.



## SUPPLIES, EQUIPMENT AND ACCESSORIES.

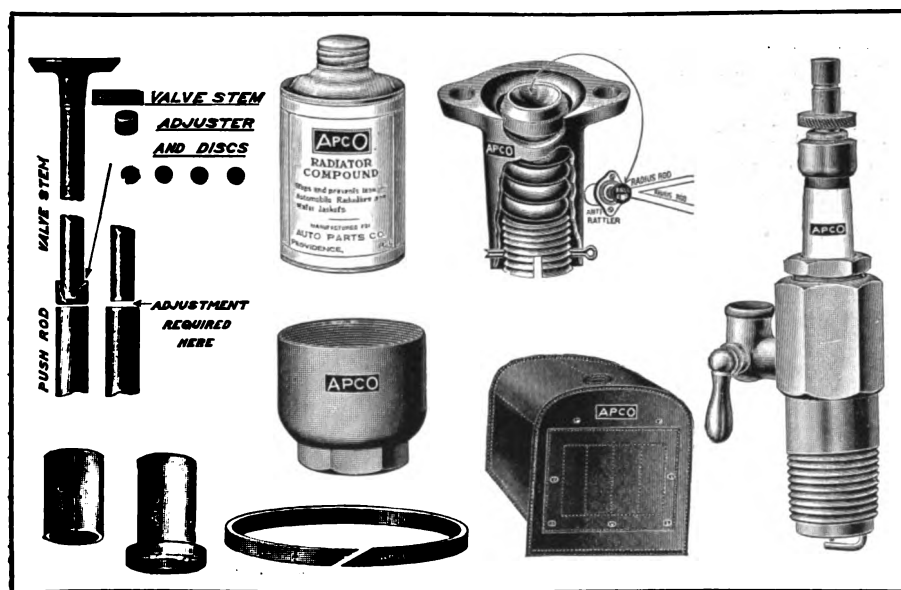
ONE of the best known makers of Ford specialties is the Auto Parts Company, Providence, R. I., which concern for years has made a careful study of Ford automobiles and has produced a large number of accessories making for comfort and convenience in operation, as well as devices improving its efficiency. The name Apco is well known to the trade and owner as representing practical Ford specialties, and the line is constantly being augmented with new inventions.

A few of these products are shown in an accompanying illustration, several being particularly adapted to the season of the year when the

cialty is the radiator cover, which is constructed of high grade material, designed to fit over the hood and provided with practical fasteners. It has a curtain of the roll-up type for service in mild weather.

The Apco radiator compound, when mixed with the water of the cooling solution, forms a liquid cement which hardens when exposed to the air, as in a leaky tube or fin, for example.

The Apco anti-rattling ball sockets are made in two styles and provide means for eliminating play in the ball end of the front radius rod and its socket. This radius rod bearing should be snug, but have a certain amount of play to prevent



Illustrating Some of the Numerous Apco Specialties Marketed by the Auto Parts Company and Adapted Particularly to the Ford Motor Car.

machine is being overhauled and equipped for winter service. The Apco valve stem adjusters are utilized for obtaining the proper space between the valve stem and tappet without altering these parts, which are of the fixed type. These members wear in time, decreasing the valve opening, thereby resulting in a loss of power, and when such is the case the opening should be restored to its normal dimension. This is done easily with the Apco adjusters, which are slipped over the valve stem as shown.

The Apco priming spark plug will be appreciated by owners who have to remove the usual spark plugs to prime the cylinders. It is the usual Apco plug equipped with a priming cock as shown, permitting of easy starting of the motor in the coldest of weather. Another Apco spe-

cialty is the radiator cover, which is constructed of high grade material, designed to fit over the hood and provided with practical fasteners. It has a curtain of the roll-up type for service in mild weather. The Apco radiator compound, when mixed with the water of the cooling solution, forms a liquid cement which hardens when exposed to the air, as in a leaky tube or fin, for example. The Apco anti-rattling ball sockets are made in two styles and provide means for eliminating play in the ball end of the front radius rod and its socket. This radius rod bearing should be snug, but have a certain amount of play to prevent breakage. The Apco is adjustable, the No. 1 style having a screw plug, while the No. 2 is fitted with discs. Both contain a heavy spring, which automatically takes up wear, and additional adjusting means are provided by the screw plug and discs. The company also markets a steering rod anti-rattler which makes it possible to eliminate lost motion in the steering linkage, as well as to prevent rattling.

The Auto Parts Company manufactures material of service in the overhaul of the Ford, including a special brake lining, brake shoes, piston rings, valves, grease cups, hub caps, fan belts, wheel puller, gaskets, wrench sets and a number of special tools which simplify the work. The Apco catalogue contains a large number of useful and practical accessories for the Ford machine and a copy will be mailed free on request.

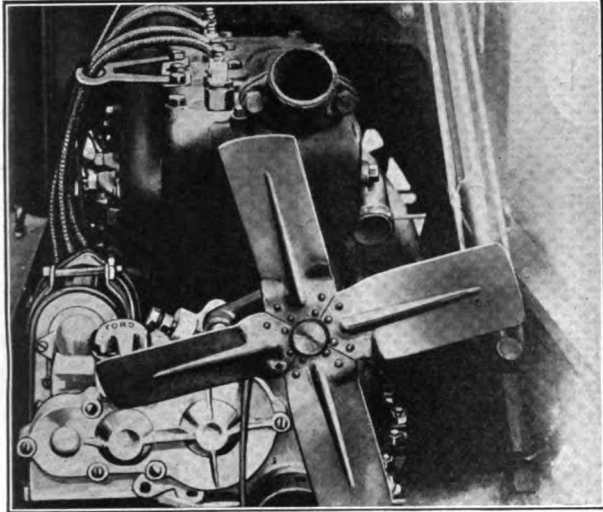
### CONNECTICUT FORD TRUNK RACK.

The Connecticut Steel & Wire Company, 61 Allyn street, Hartford, Conn., specializing in trunk racks, has brought out a moderately priced design for model T Ford cars. It is constructed of the same high grade material and workmanship for which the product of this concern is noted and comes complete and ready for attachment to the machine.



# SPLITDORF MAGNETO EQUIPMENT FOR FORD.

THE advantages of perfect synchronization of the spark, especially with high speed motors, is well known to ignition experts. Not only



Illustrating New Timing Gear Plate and Bracket and Splitdorf Magneto, an Equipment Designed Especially for Ford Motors.

is the output of the motor increased, but economy is obtained, as a more complete burning of the charge is possible. By synchronizing the spark, the power plant is subjected to less stresses.

The Splitdorf Electrical Company, Newark, N. J., is marketing a true high-tension, compact, high grade magneto designed especially for service with the model T Ford motor, and this with a new timing gear plate and all necessary fittings are offered at a moderate cost. The magneto is of the fixed spark type, which eliminates the usual Ford timer, timer rod, primary wires, coil, etc., and the design of the instrument makes for motor efficiency in that the spark cannot be improperly varied by the driver.

The installation is made easily, requiring no other knowledge than that of timing magneto.

One of the qualities of the Splitdorf magneto emphasized is that it permits starting of the motor easily on a quarter-turn of the starting crank. The equipment is carried at any of the branches of the company, which are listed in the Classified Buyers' Guide, found elsewhere in this issue.

## IGNITION SPECIALTIES.

The Eisner-Lenk Company, 1024 Boylston street, Boston, distributor for Eisemann, Simms

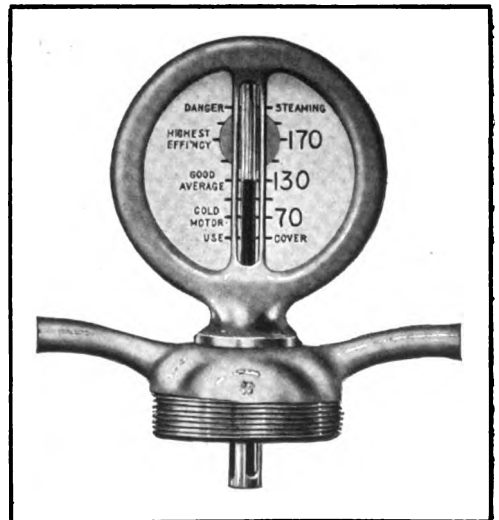
and Mea magnetos, makes a specialty of repairing all types of ignition, lighting and motor starting systems and carries in stock parts for standard types of magnetos. The Eisner-Lenk Company also represents the Gilbert line, this including covers for tires, lamps, magnetos, etc.

## BOYCE MOTOMETER FOR FORD.

The Motometer Company, 1790 Broadway, New York City, has brought out a special Motometer for the Ford car, which is illustrated herewith, and it is easily attached to the radiator by means of the cap shown, both units being included. The device is provided with a special type of thermometer or meter in which is a red fluid. The dial is calibrated as illustrated, and the fluid rises or falls according to temperature of the water in the radiator. The height of the red fluid is noted easily through an opening, making it possible to take a reading from the seat even at night, as the rays of the lamps make a white background.

As the Motometer is constantly in plain view of the driver, he can tell at a glance the operating conditions of the motor. When the fluid registers in proximity to the danger point it denotes a lack of oil or water, or other engine troubles, and inspection or correction may be made before damage ensues. Among the other advantages attendant upon its use is that the radiator cover may be so arranged

as to provide the best working temperature of the motor, which is also indicated on the dial. Another point denotes when the fluid approaches freezing, thereby eliminating guess work. The Motometer is moderately priced and a special offer is made to Ford owners.

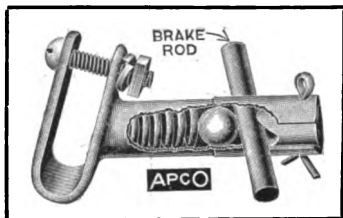


Ford Special Boyce Motometer.



### APCO BRAKE ROD ANTI-RATTLER.

The Auto Parts Company, Providence, R. I., manufacturer of Apco specialties for model T



Apco Brake Rod Anti-Rattler.

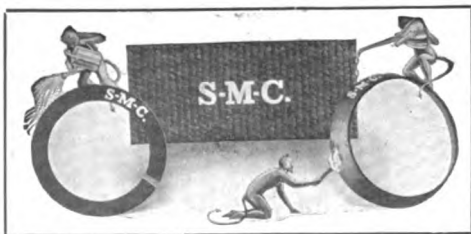
For cars, has brought out a new device for these machines, which will be appreciated by owners whose brake rods rattle. The maker states that it is the only anti-rattler that can be applied without removing the clevis and without fitting, etc. All that is required to place the device is a screw driver, the tool being employed to tighten the clamping bolt on the radius rod.

As will be noted by the accompanying illustration, the brake rod is located between a ball bearing and a plunger, the proper tension being maintained by a spring. The pressure is such as to firmly hold the rod in place, but does not interfere with its forward or backward movement in service. The rattler is installed by removing the cotter pin and plunger and slipping the U shaped member over the radius rod, at the same time locating the brake rod as shown in the drawing.

### S-M-C FORD BRAKE LINING.

In renewing the service brake lining, which is enclosed in the transmission housing of the Ford car, it is recommended that the use of friction material having any metal reinforcement be avoided, as it is stated that it may affect the efficiency of the flywheel generator. The Staybestos Manufacturing Company, Germantown, Penn., is producing a special friction material for Ford machines which does not contain any brass wire or other material that would impair the efficiency of the generator.

The S-M-C friction material is not a cotton



S-M-C Brake and Clutch Lining.

as to make a homogeneous mass, one that will not deteriorate when subjected to the most severe service. It is treated with a special compound

fabric, but is made from long fibre, carefully selected, and tested asbestos, which is so woven

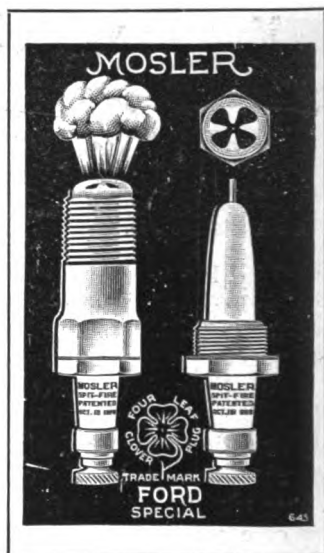
obtaining the same high degree of coefficient of friction until completely worn out.

The maker states that the S-M-C, when applied to metal as in brake service, will lock the wheels instantly if desired, an important factor to be considered in the selection of friction material. It is not affected by heat, water, oil, gasoline, etc., and is guaranteed in every respect.

The company manufactures brake lining for all types of machines, also all types of friction facings for clutches, etc., and these are carried in conventional sizes or made to meet special requirements. The Ford lining is 1.125 or 1.0625 inches wide and .15625 thick.

### MOSLER SPECIAL FORD PLUGS.

The value of proper design with spark plugs and the correct location of the firing points in the combustion chamber of the cylinders is recognized by car manufacturers and ignition experts. As a result of considerable experimentation, a distinct type of plug is now being made for each motor, which not only increases its output, but reduces troubles to a minimum. A. R. Mosler & Co., Mt. Vernon, N. Y., produces among many types two designs especially adapted to the model T Ford motor and one is illustrated.



Mosler Four-Leaf Clover Special Spark Plug.

The Four-Leaf Clover special, so designated because of its construction, not only provides four electrodes or firing points, but prevents soot, carbon or oil from short circuiting the points. Another quality emphasized by the design is that the flame is projected into the mixture, completely igniting it. The construction also permits of easy disassembly and assembly and without disturbing the position of the central electrode in respect to the shell members.

The Superior plug is also adapted for the model T Ford motor and embodies the same high grade workmanship and material that characterizes the product of the maker. The wire attached to the shell or base is so formed that the gap is protected against any particles of oil, soot, etc.



## SPECIALIZES ON FORD EQUIPMENT.

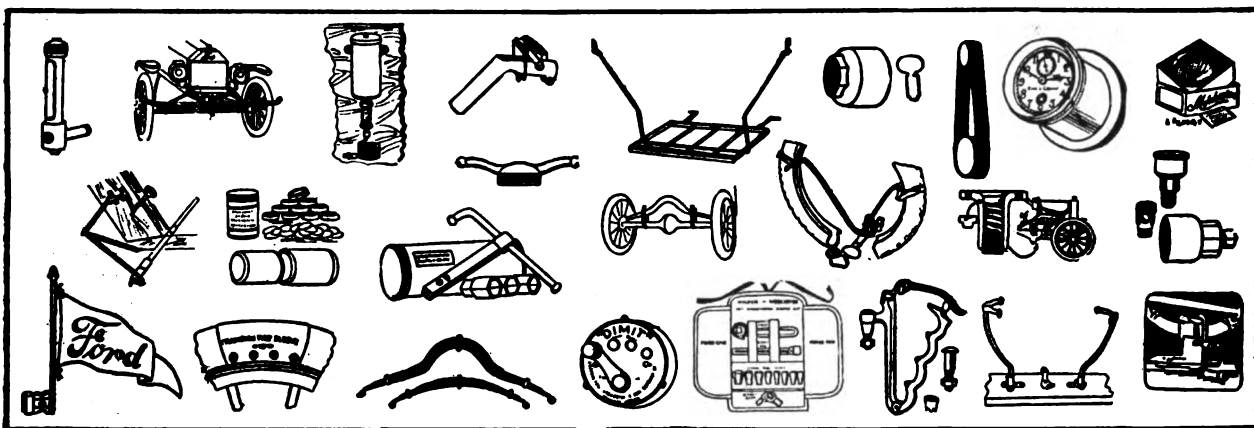
**T**HE preparation of the car for winter service, including as it does the overhaul of the chassis, etc., affords opportunity to replace worn parts and to add those accessories which improve its operation, as well as make for convenience. The American Auto Supply Company, 1741 Broadway, New York City, makes a specialty of Ford accessories, etc., and its 1914 catalogue is stated to be the largest ever devoted exclusively to the Ford car. Some idea of its size may be obtained by the number of illustrations utilized, there being over 200. These depict many new Ford specialties and all are described in such manner as to show the application and advantages derived from their use.

The section devoted to parts is very complete, the company making a specialty of these, all of which are constructed of high grade material and

tically every ignition accessory for the Ford motor is carried in stock, also standard parts. A number of pages are devoted to oil, gas and electric lighting equipment and devices making for economy when the car is fitted with acetylene.

The catalogue presents a wide variety of useful and practical articles necessary when equipping the machine for winter, as well as summer service. These include top covers, hood covers, signalling devices, shock absorbers, bumpers, trunk racks, anti-rattlers, locking devices, moldings, lamp brackets, license holders, trunks, lamp and tire covers, priming devices, fuel economizers, cigar lighters, inspection lamps, starting crank holders, fuel gauges, top holders, mats, ventilators, power tire pumps, demountable rims, etc.

The American Auto Supply Company will forward its catalogue free on request, and the



Showing Some of the Ford Parts, Accessories, Supplies and Equipment Marketed by the American Auto Supply Company, Which Issues Special Ford Catalogue Containing Over 200 Illustrations.

carefully finished to exact size. Among the many parts that may be needed in the overhaul and that are carried by this concern are: Gaskets, piston rings, carburetors, hose and clamps, valve springs, grease and oil cups, front and rear springs, hub caps, etc.

There is a large number of tire equipment listed, including casings, tire repair kits, vulcanizers, covers, tire holders, locking devices, etc. Various types of wrenches useful in the overhaul, comprising wrench sets particularly adapted to the Ford car, are illustrated among the tools, which also include valve lifters, wheel pullers, etc.

The American Auto Supply Company carries an extensive stock of ignition specialties and offers a number of different types of master vibrators. Parts for these and for coils and different designs of spark plugs are listed, and several of the last named have priming attachments. Prac-

booklet contains instructions for ordering, as well as a table on the cost of shipping by parcel post.

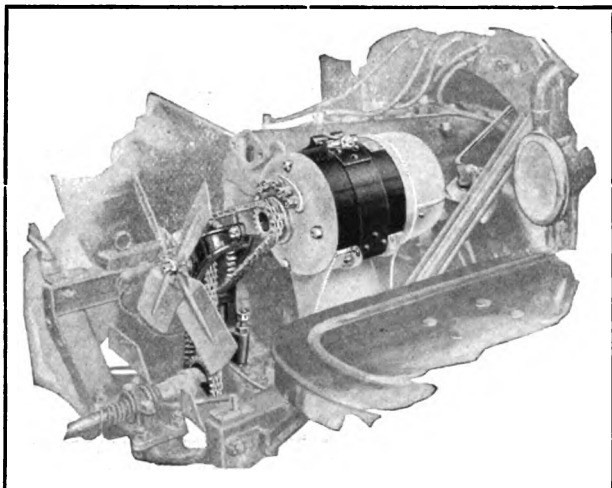
### BOSCH SPARK PLUGS.

The Bosch Magneto Company, New York City, is manufacturing the Bosch spark plug, which is constructed for motor cars and motorcycles. The insulator is steatite, placed in the shell under high pressure, insuring a gas tight construction. The electrodes are a nickel alloy and being knife shaped the spark does not jump across any particular point, but forms a ribbon of flame between the electrodes, which are three in number. Sooting is prevented, as the electrodes are maintained at a high temperature, burning away any lubricant that may gather. The plugs are in various sizes and are adapted to withstand magneto currents.



## NORTH EAST FORD MOTOR-GENERATOR.

THE North East Electric Company, Rochester, N. Y., maker of electric lighting and motor starting systems, has brought out an installation



Side View of the Installation of North East Motor-Generator on Ford Motor.

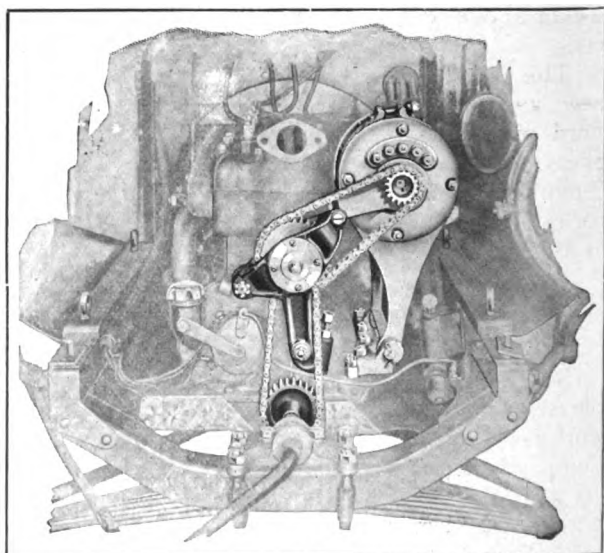
for model T Ford automobiles which presents interesting features, in that it can be mounted without alterations. The company states that it has equipped several cars with the system; that it has proven successful in every particular, and that the same high grade workmanship and material is incorporated as with similar equipment manufactured for larger vehicles. The equipment is simple and it is stated that it may be installed in a few hours by the garage man or by those owners familiar with the use of ordinary automobile tools. There are no fittings, wires, etc., to be purchased, the maker supplying all material, even including the adapters for the lamps. The instructions and diagrams accompanying each outfit are very complete, each part being numbered to facilitate installation.

The North East system is a unit, a dynamo and motor combined, the armature carrying but one winding and having a set of brushes mounted in a special manner. All insulation utilized is either clear mica or bakelite, and the pole pieces are of the built-up laminated type, accurately sized by grinding. The field ring is of pure wrought iron, heat treated and ground to size. The bearing housings are of aluminum, carefully machined. The system is entirely automatic in its operation, and the maker lays great emphasis on its simplicity, stating that it is fool proof in that no damage can result from operating the starting button with the engine running. It is also

claimed that it requires but a small amount of current to spin the motor and this is quickly restored with the motor operating. One of its features is that it is not restricted to low candlepower lamps, and 40 candlepower members may be fitted to the headlights if desired.

The operation of the system is simple. Upon desiring to start the engine the operator turns on the ignition current and depresses the pedal starting button, which closes the circuit between the storage battery, allowing current to flow to the electric motor. Upon the motor starting the generator charges the battery, which supplies current for lighting and when the car is inoperative.

The motor-generator is mounted on the left hand side of the engine, being supported and retained by a special bracket. The armature shaft carries a sprocket, and energy as a motor starter is supplied to a sprocket on the fanshaft through a silent chain. As will be noted by an accompanying illustration, another chain imparts the drive to the extension of the crankshaft of the engine, this being fitted with a sprocket. No provision is made for a back kick, as the engine is directly connected to the motor generator through chains and countershaft. The motor-generator operates at three times crankshaft speed and its output as a dynamo is ordinarily 96 watts, but



Front View of North East Lighting and Starting Unit, Illustrating Method of Mounting and Silent Chain Drive.

this can be doubled if desired. Regulation of the output of the dynamo is accomplished by the special field winding. The lamps are 14-volt.



### MOSSBERG FORD WRENCH SETS.

In dismantling the Ford chassis and making adjustments, there is a large number of nuts, bolts, etc., which are not removed easily with ordinary tools. Those retaining the caps of the three main crankshaft bearings present more or less trouble when the work is attempted with ordinary forms of wrenches. Then again, there are places where there is not room to swing an S wrench in displacing a part. As it is important that all nuts, bolts and parts be set up snugly, much better results will be obtained if the workman is equipped with the necessary tools.

The Frank Mossberg Company, well known maker of wrenches and wrench sets, has brought out an inexpensive wrench set for the model T Ford car which includes, in addition to the No. 350 ratchet wrench, 10 hexagonal and square, mottled finished, thoroughly hardened sockets. A specially designed oval socket is provided for removing and replacing the nuts retaining the main bearing caps, which are not easily accessible with the usual tools. In the equipment is a spark plug wrench, screw driver bit, Mossberg monkey wrench and a 10-inch extension, which permits of reaching parts within the crankcase, transmission, etc.

The No. 17 Ford set is less expensive and is a practical outfit, being designed especially for heavy duty work. It comprises five eight-inch bars with a socket at each end, also the oval socket above referred to and the spark plug member.

The Mossberg company is bringing out two new valve grinding tools made especially for Ford motors, also a new form of drop forged pliers. Announcement will be made shortly of a demountable rim brace with adjustable features, permitting of its use on all types of rims, as well as for other service.

### SE-MENT-OL.

Soldering a leaky radiator usually requires the services of the expert, and sometimes the work is expensive. The Northwestern Chemical Company, Marietta, O., is marketing Se-Ment-Ol, a chemical preparation which, when poured into the radiator, mixed with the water and circulated, finds all leaks and openings, completely sealing them. This result is obtained by the preparation hardening quickly when exposed to the air. The maker states that it does not injure the components of the cooling system and that ordinary leaks may be repaired in a few minutes.

The company is also marketing Thermite, which is an anti-freezing solution that is mixed with the water in any proportion to suit the temperature at which freezing is to be prevented. The maker states that the chemical preparation will not evaporate, injure the metal or rubber, and that it does not boil as easily as water, thereby adapting it to mild weather.

### RETURNS FROM ABROAD.

E. J. Kestenbaum, president of the American Auto Supply Company, 1741 Broadway, New York City, who is presented in an accompanying illustration, returned Nov. 10 from a combined business and pleasure trip abroad. He travelled throughout England, Ireland, France, Germany and Austria, and was particularly observant as to the possibilities of securing accessories for Ford cars.

The American Auto Supply Company is held to be one of the largest, if not the largest, dealer in Ford accessories and supplies in this country. Mr. Kestenbaum is especially active in this field, and loses no opportunity to get in touch



E. J. Kestenbaum, President American Auto Supply Company.

with manufacturers and designers of equipment which presents features making for economy, efficiency or convenience in the operation of this make of machine. The company is issuing a completely illustrated catalogue of such equipment, which will be mailed free upon request.

The Fulton Company, maker of the Aermore exhaust horn, has moved from Marshalltown, Ia., to its new plant at 726 National avenue, Milwaukee, Wis. This change involves a material enlargement of the company's production capacity and the incorporation under the laws of Wisconsin with a capital stock of \$25,000. S. A. Fulton is president and G. F. Morrissey is secretary and treasurer.



## DOVER SPECIALTIES.

The Dover Stamping & Manufacturing Company, Cambridge, Mass., is marketing a number of useful and practical specialties which make for economy and convenience in the upkeep of the motor car. Among these is the Dover compact oiler, shown herewith, which is very handy for carrying in the tool box, etc. It is 6.5 inches long, three wide and 1.125 thick, and has a four-inch reversible spout.



Dover Oiler.

The Saval funnel will appeal to motorists who experience difficulty in replenishing the supply of lubricant to the motor, as the Dover is equipped with an automatic shut-off attachment, which enables the user to incline the measure and control the flow of lubricant. The spout has a brass ball valve, ground to an oil tight fit, and it is controlled by an easily operated and convenient plunger member.

The Dover soap economizer is a sturdily constructed pail with ball, and by the utilization of a perforated disc or pan, not only is waste of soap prevented, but the sponge is kept clean. The pail is filled with water and utilized in the same manner as an ordinary member.

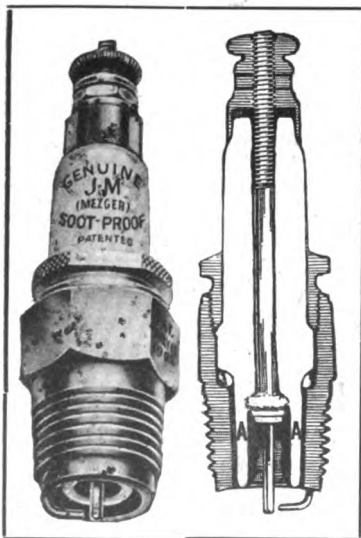
## BLUE RIBBON PRODUCTS.

The International Metal Polish Company, Quill and Naomi streets, Indianapolis, Ind., is marketing the Blue Ribbon cement for stopping leaks in the circulating system of a motor car. It is a chemical preparation which is mixed with the water by pouring it into the cooler and by operating the motor the fluid is circulated and forced through the cracks or openings in the radiator, etc. On coming in contact with the air the solution forms a cement.

In addition, the company manufactures Blue Ribbon cream metal polish, and Blue Ribbon nickel polish, both of which impart a high lustre to the metal trimmings of the car and with little effort. The company also markets the Blue Ribbon auto body polish for restoring the finish and gloss, and the maker states that it will not leave any coating to catch dust, etc.

## J-M (MEZGER) SPARK PLUG.

The H. W. Johns-Manville Company, New York City, manufacturer of motor car specialties, etc., has taken



J-M (Mezger) Spark Plug.

over the well known Mezger Soot-Proof spark plug, two views of which are shown herewith. The plug has been on the market for a number of years and is said to be one of the first in America to be designed and built on scientific principles.

Among the specialties produced by this concern are Solderall, J-M dry cells, J-M universal terminal, J-M Keystone radiator shield, J-M fire extinguisher, J-M friction tape, J-M non-burn brake lining, Noark enclosed fuse, etc. The company is marketing the J-M Mobilite electric lamp, which is particularly designed for used automobiles. The lamps are made in several forms and are very compact.

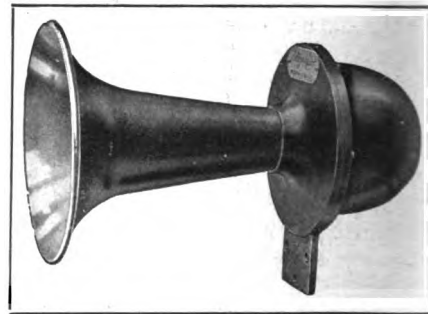
## J. M. SHOCK ABSORBER.

The J. M. shock absorber, marketed by the J. M. Shock Absorber Company, 210 South 17th street, Philadelphia, is the invention of a French mechanical engineer, who claims to have solved the problem of applying a helical spring principle to the laminated spring of a car. Except on a car having a full elliptic spring, the car spring is attached to its end by a shackle, to allow for elongation of the laminated member. In the J. M. this shackle is replaced by its equivalent, a bronze head, which acts as a guide for the helical bolts of the absorber and a bearing for the hanger bolt. Attached to the bronze head is a tube in which is confined the helical spring. This tube allows the spring to be compressed along a true plane at right angles to the car spring, thus obtaining its maximum efficiency. The J. M. is constructed for different types of springs and a special design is made for Ford cars. It is also made in single and twin types.

## REACTO ELECTRIC HORN.

The Holtzer-Cabot Electric Company, Chicago and Boston, is manufacturing the Reacto horn, shown in an accompanying illustration, and among the features of the design emphasized is its tone. It provides a clear and penetrating, but not harsh tone; is moderately priced and is constructed with the same high grade material and workmanship for which the product of this concern is noted.

One of the features of the horn is that it will respond to voltages 25 per cent. below normal and therefore does not require adjustment. Means are provided, however, for changing the tone. The Reacto horn is designed to meet the requirements of motorists desiring a strictly high grade signal, one having a pleasing tone, and capable of maximum service without attention. The casing and projector are of best material and the construction is sturdy.



Holtzer-Cabot Reacto Horn.

## PYRENE FIRE EXTINGUISHER.

Cold weather presents more opportunity for fires than in the summer, as in starting the motor it is likely to back fire if the mixture is weak and there is more or less opportunity for the vapor of the fuel to ignite when the building is heated by stoves, etc. The Pyrene Manufacturing Company, 1385 Broadway, New York City, is marketing the Pyrene fire extinguisher, which is very compact and weighs but five pounds. It extinguishes fires by the formation of an elastic non-poisonous blanket which separates the flame from the burning material. It contains no acid, alkali, salts or moisture, and it will not injure any material with which it is brought into contact.

## WEED ANTI-SKID TIRE CHAINS.

With the approach of winter and its attendant ice and snow, the careful motorist equips the rear wheels, and sometimes the front as well, with anti-skid tire chains. These are not expensive and make for a cheap insurance, as they not only provide traction on slippery thoroughfares, but prevent accidents. They are easily and quickly attached, and coming as they do in a neat canvas bag may be stored easily in the car. The Weed Chain Tire Grip Company, 28 Moore street, New York City, is the maker of the well known Weed anti-skid chains, which are carried in various sizes by dealers and supply houses.

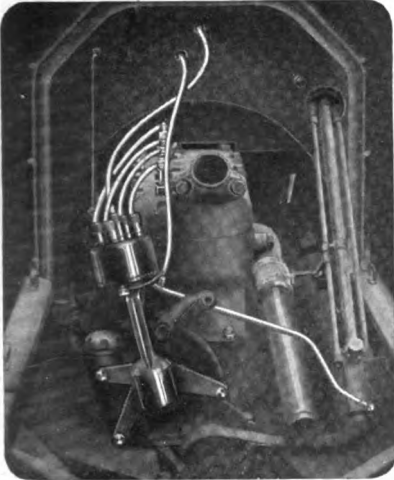


**BOSTON FORD STARTER.**

The Automobile Sundries Company, 18 Broadway, New York City, is marketing the Boston starter designed especially for model T Ford motors. It is a mechanical starter, operates from the seat and starts the engine with the same certainty as though the crank were used. One of the qualities of the Boston is that it does not interfere with the use of the usual starting crank. The starter is provided with an automatic release for protection, and as a further precaution the spark is automatically fully retarded before the engine is turned over. The device may be installed easily and without interfering with or changing the appearance of the machine, as the equipment, with the exception of the operating handle, is fitted under the hood. The handle is installed on the dash within convenient reach of the driver, and is connected with the starter mechanism by a special cable. As a considerable leverage is obtained by the starter proper, the motor may be turned over easily by a child. The entire construction is neat and substantial.

**ATWATER KENT FORD IGNITION SYSTEM.**

The Atwater Kent Manufacturing Works, 4932 Stenton avenue, Philadelphia, well known to the trade as maker of the Atwater Kent ignition system, announces the application of its Unisparker or distributor to the model T Ford motor. It is designed especially for the engine in question and as shown in the accompanying illustration comprises a bracket carrying the Unisparker, and a feature of the construction is that it may be installed quickly and without any other tools than a screw driver and a wrench. The parts are accurately made and finished and require no fitting whatsoever.



**Atwater Kent Ford System.**

The Atwater Kent system is well known. It consists of the Unisparker or distributor and a single non-vibrating coil. It not only assures perfect synchronization of the spark, but permits of operating the motor at very low speeds, as well as at high ratios, without heating. Considerably more power is obtained, due to the perfect spark. The device made for the Ford motor replaces the usual timer and is in an elevated and accessible position. The system also includes a push button, permitting of starting from the seat. The Atwater Kent Ford ignition comes with hand or foot operated switch. Six ordinary dry cells or a six-volt storage battery replaces the Ford magneto as a source of current, permitting the generator to be used for lighting. The company has a special trial offer for Ford owners.

**EXCELSIOR VENTILATOR.**

C. B. Wattles, 441 Butler Exchange, Providence, R. I., is manufacturing the Excelsior adjustable ventilator for model T Ford cars, which is a moderately priced attachment and which permits of admitting fresh air to the front compartment of the machine. The opening is adjustable as desired and is quickly operated from the seat. It can be installed in a few minutes and comes finished in black enamel. When fitted to the dash it is hardly noticeable.

**HOYT FORD MAGNETO TESTER.**

The Hoyt Electrical Instrument Works, Penacook, N. H., maker of current testing devices, is manufacturing the Hoyt Ford magneto tester, shown in an accompanying illustration. It is utilized to show the quality of the electricity generated by the flywheel magneto on model T Ford motors, and the dial of the instrument is calibrated. The meter is compact, being 3.5 inches in diameter, and is constructed with the same care characteristic of the product of this company.



**Hoyt Ford Magneto Tester.**

For the purpose of simplifying the use of the magneto tester three points are indicated, these being "Poor", "Medium" and "Good". The test is made easily, the device being provided with two cables and either one may be utilized in connection to the magneto terminal. The remaining lead is grounded.

**NYCO TWO-SYSTEM SWITCH.**

The New York Coil Company, 338 Pearl street, manufacturer of a very complete line of Ford accessories, including a master vibrator, Nyco accelerator, etc., announces the Nyco two-system switch. This is a new device, the function of which is to enable the operator of a Ford machine to run on the four separate units, just as the car is regularly supplied, or, by kicking over the switch, the four vibrators become short-circuited and the master vibrator operates each of the four coils. It will thus be seen that to make the change from the four separate coils to the master vibrator does not necessitate changing any of the connections whatsoever.

This instrument will be appreciated by many operators who are skeptical about screwing down the vibrators and thus changing the adjustment of the coil.

**HEINZE MODEL T FORD COIL.**

The Heinze Electric Company, Lowell, Mass., is manufacturing a special type of four-unit vibrating coil designed for service with the model T Ford flywheel generator. Owing to the special windings, vibrator and general construction, the maker guarantees its efficiency when used with the Ford ignition system. The vibrator is rapid and positive in its action the high efficiency of the coil is emphasized. The secondaries are wound in eight sections with one continuous wire, on a patented wood spool with double silk insulated wire. This permits, the maker states, of utilizing a greater number of turns than ordinarily. The method of winding also is held to eliminate the possibility of burning out or breaking down.



**Heinze Four-Unit Ford Coil.**

The method of winding also is held to eliminate the possibility of burning out or breaking down.



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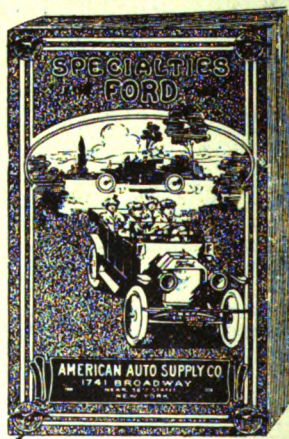
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Low prices and *standard quality* of merchandise has held us at the top. That is why this is the best place in the country to buy *Ford accessories*.

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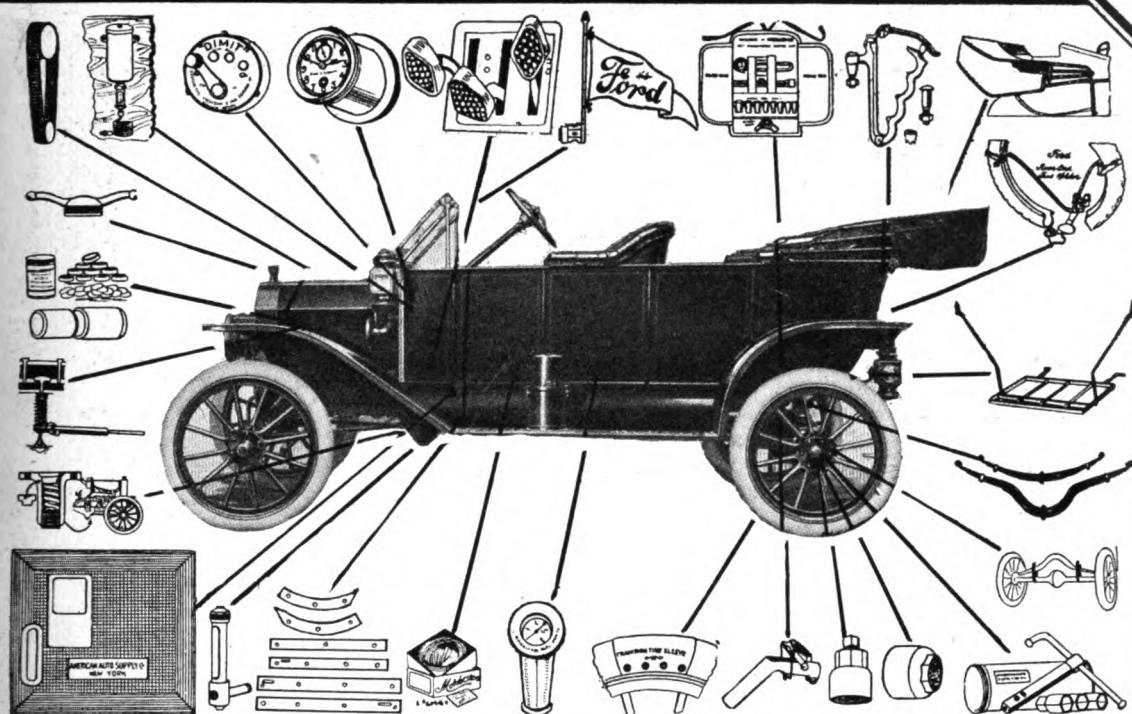
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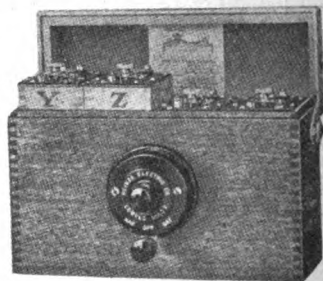


# HEINZE COILS

HECO COILS were adopted by the FORD COMPANY for their model T cars because it was proved by tests that these coils would operate the light, high speed motor of the Ford up to its full capacity. The HECO COIL insures perfect synchronism with the fly wheel magneto. It provides a larger, hotter spark than others because its core is made of iron wire of proper gauge, while the secondary is wound with the best grade of silk covered wire. Everything about HECO COILS—their design, their construction, and the material used in them, points to the highest efficiency.

Motorists, our exchange offer is worth your attention. If you are not using the HECO COIL on your model T Ford car now, send us your old coil with \$15 and we will forward you one of our famous HECO COILS. This means that your old coil is worth \$23 toward the purchase of a new HECO.

**HEINZE ELECTRIC COMPANY,** Factories & General Office, Lowell, Mass.  
Sales Office, Detroit, Mich.



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SPARK  
AT ANY  
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Quality goods  
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Adopted after test as regular equipment on Quality Cars. Woven of the purest of asbestos and treated by an exclusive formula. Multibestos has the highest co-efficient of friction and wears most uniformly through the longest life.

**Standard Woven Fabric Co., Framingham, Mass.**

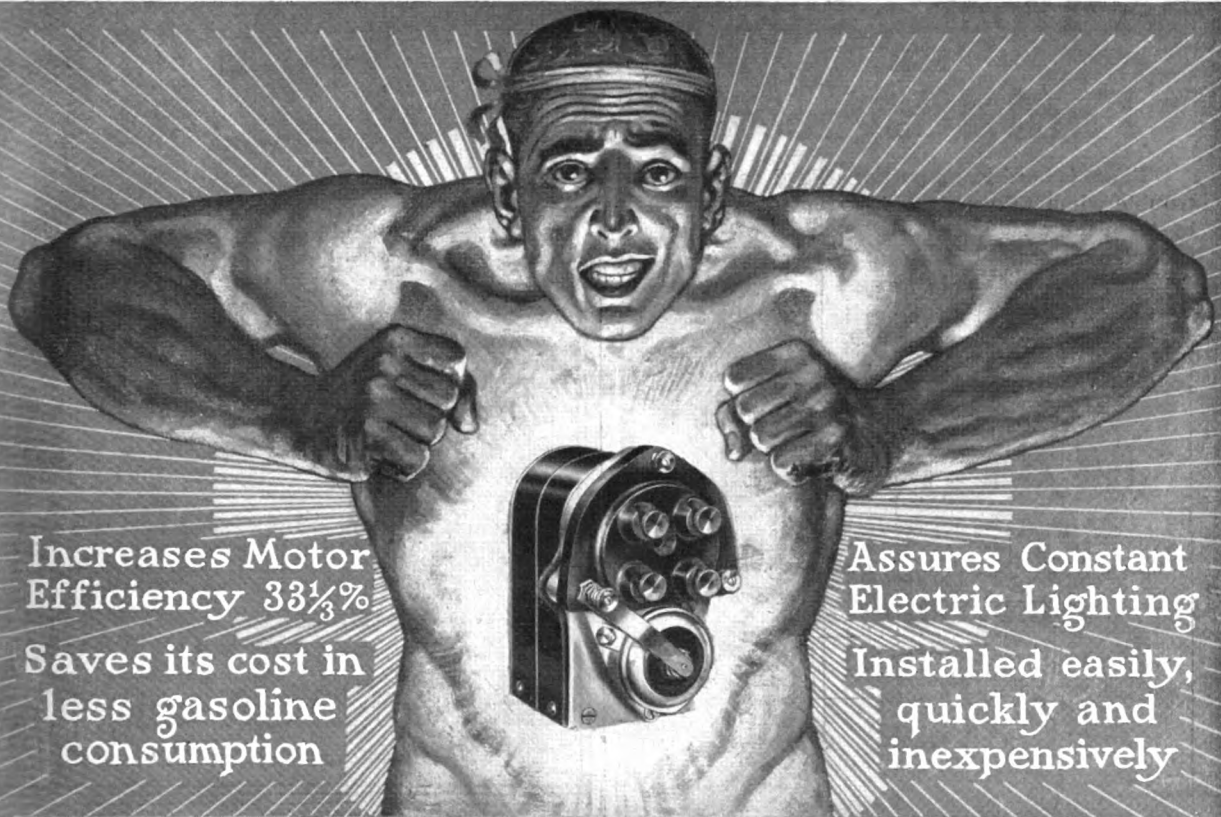
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Increases Motor  
Efficiency  $33\frac{1}{3}\%$

Saves its cost in  
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Assures Constant  
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Installed easily,  
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### WATERPROOF HIGH-TENSION MAGNETO

Enclosed direct gear driven—no chains or open gears—the SPLITDORF "FORD SPECIAL" high-tension magneto is revolutionizing the running of the remarkable little cars.

Compact and strictly waterproof, the thoroughly tested SPLITDORF "FORD SPECIAL" magneto is specially constructed to meet the demands of Ford cars.

With its installation in a few hours the nuisance and expense of vibrators, coils and batteries pass away and a high-tension system secured that gives remarkable results.

*Write or Call Today upon our nearest Branch House for full information*

### SPLITDORF ELECTRICAL COMPANY

ATLANTA, 10-12 East Harris St.  
BOSTON, 180-182 Mass. Ave.  
CHICAGO, 64-72 East 14th St.  
DETROIT, 972 Woodward Ave.  
KANSAS CITY, 1823 Grand Ave.  
LOS ANGELES, 1226 South Olive St.

NEWARK, 290 Halsey St.  
NEW YORK, 18-20 West 63rd St.  
PHILADELPHIA, 210-212 N. 13th St.  
SAN FRANCISCO, 1028 Geary St.  
SEATTLE, WASH., 1628 Broadway  
LONDON BUENOS AIRES



## A Trouble Finder FOR Ford Magnetos

There is hardly any part of a Ford car where trouble when it does occur is so hard to locate as in the magneto. Often a great deal of time is wasted hunting elsewhere in the system for the defect before it is finally located in the magneto.

To obviate this difficulty is our purpose in presenting the

## FORD MAGNETO TESTER (HOYT QUALITY)



a simple instrument that will tell at a glance whether or not the magneto is generating and to what extent.

The scale is marked "poor", "medium" and "good", and the index needle points to the position on the dial indicating the condition of the magneto. The method of connecting is very simple. Two cables supplied with the indicator are connected to the magneto, and the engine is run at normal speed. The condition of the magneto is then read on the dial. The instrument is of unvarying accuracy and simply cannot fail to record magneto strength.

Service station and repair shops everywhere need this Hoyt instrument. Write for details and prices.

**Hoyt Electrical  
Instrument Works**  
PENACOOK, N. H.



## FORD SPECIAL BRAKE LINING

Is not a cotton fabric, but made from long fibre asbestos, has several times the life of cotton lining, compactly woven, treated through and through with a special compound, insuring same coefficient of friction until completely worn out.

The S. M. C. special Ford brake lining is made without brass wire, which makes it the one lining to use on Ford machines.

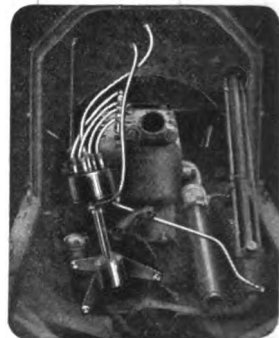
As manufacturers of the completed product we are in a position to make immediate delivery. Our guarantee goes with every sale as to the quality and service of the S. M. C. brake and clutch lining.

S. M. C. is not affected by heat, water, oil or gasoline, is made to fit any brake, friction or transmission clutch.

**Staybestos Manufacturing Co.**

Germantown, Philadelphia, Pa.

## The Atwater Kent Ford Ignition



does more than eliminate the frequent and troublesome adjustment of the Ford coils.

The Atwater Kent Ignition assures perfect synchronization at all speeds, eliminating preignition and overheating—starts easily with a quarter turn of the crank and frequently without cranking by means of the starting button on the coil.

Effects a saving in gas, wear and vibration by enabling the motor to run slowly while the car is standing and run as smoothly "on high" at four miles an hour as at thirty or fifty.

The Atwater Kent will, in addition, wonderfully increase the power, speed, flexibility and hill-climbing ability of the Ford car, and gives superior results and costs less than half that of the high tension magneto.

It consists of the Unisarker or distributor elevated to a convenient and accessible position which takes the place of the Ford timer and a single non-vibrating coil is installed in place of the four vibrating coils.

It is easily installed by any one who can time a motor—no holes to bore—a screw driver and wrench are the only tools required.

Price complete with hand-operated switch \$28.00—foot-operated switch \$2.00 extra.

Write for particulars regarding our thirty-day trial offer to Ford owners.

Write at once for Circular "L" and trade prices.

**ATWATER KENT MFG. WORKS**

4932 STENTON  
AVENUE  
PHILADELPHIA

When Writing to Advertisers, Please Mention The Automobile Journal.





## "THE SPARK THAT NEVER FAILS"

—never fails the motorist who uses it, or the dealer who sells it.

Here is the way the manufacturers of a prominent car tested the

## *Blitz* Spark Plug

They deliberately smashed the porcelain of all four plugs in the car, and then drove it up hill and down. Not a cylinder missed fire!

**Blitz Plugs stand such remarkable tests because of their double insulation.**

The Blitz is the one spark plug with a mica-wound sleeve completely encased in porcelain. Big electrodes, simple parts. No better plug at any price.

Watch for our advertising of Blitz Plugs and also the big campaign telling the public the advantage of

## *Jericho* HORNS

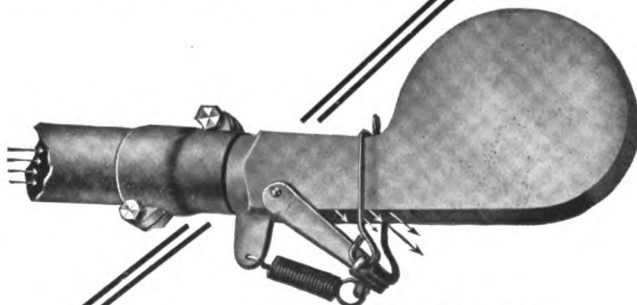
Their sound is powerful but persuasive. They warn without offense. Cost nothing to operate. Cannot clog or get out of order. Therefore the most satisfactory horn to sell, because no complaints or come-backs.

**Dealers, write for the new and unusually profitable offer to the trade.**

## The Randall-Faichney Company

Jamaica Plain Station, Boston, Mass.

Manufacturers of the famous B-Line all-metal, non-leakable, Oil-Grease Guns.



## THE HORN THAT SAYS PLEASE

When Writing to Advertisers, Please Mention The Automobile Journal.





**YOU CAN'T HELP IT!**  
**WE CAN!**  
**EISNER**  
**LENK CO.**  
**IGNITION**  
**SPECIALISTS**

MAGNETOS, COILS, TIMERS,  
 BATTERIES, GENERATORS,  
 STARTING AND LIGHTING  
 SYSTEMS

**Largest and Oldest Ignition House in New England**  
**ACKNOWLEDGED AS LEADERS BY THE TRADE**

Established and Developed with the Industry, Known to Thousands of Car Owners for specialized Service, We Have Equipment and Facilities to Repair or Restore Any Ignition System or Part and Give Satisfaction. We Are Known as Experts and Have Earned That Distinction.

Our Repair Department Is Prepared to Undertake Any Restoration Work and Deliver It When Promised. We Can Meet Any Requirement for Quick Repairing. We Can Save You Valuable Time and Unnecessary Expense.

**NEW ENGLAND DISTRIBUTOR**  
**FOR**

**Eisemann Magnetos**

**Simms Magnetos**

**Mea Magnetos**

Complete Stock of New Instruments of Every Type and Size, and Repair Parts  
 Prices That Will Justify Your Inquiry and Examination

Distributor of Products of the Gilbert Manufacturing Company, New Haven, Conn., Maker of the Noted GILBERT Tire, Lamp, and Magneto Covers and Fabric Automobile Specialties The Most Complete Line Manufactured.

**EISNER-LENK CO.,**  
 1074 Boylston St. Boston Mass.

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# BOSTON STARTER

FOR

## Ford Automobiles

The Boston Starter will start the motor of the Ford Automobile from the driver's seat with the same reliability and with greater ease than if the regular starting crank is used. It does not interfere with the use of the regular hand crank. It does not change the appearance of the car. It automatically retards the spark, and releases in case of backfire.

Thousands of owners of the Ford automobile testify to the satisfaction they have received from the Boston Starter. A most desirable addition to the Ford Automobile, placing it on a par with the highest priced cars.

MANUFACTURED BY

## Automatic Appliance Company

172 Columbus Avenue, Boston, Mass.

DISTRIBUTED BY

BALTIMORE, MD.,  
Robert W. Butler,  
4529 Park Heights Ave.

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Ford Supply Company,  
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NEWARK, N. J.,  
Ford Specialty Company,  
10 Bleecker Street.

PROVIDENCE, R. I.,  
William Burton,  
103 Bradford Street.

SCHENECTADY, N. Y.,  
Dorp Auto Company,  
307 State Street.

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Frank X. Irr,  
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18 Broadway.

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Boston Starter Company  
of Kentucky.

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SOUTH BOSTON, VA.,  
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SYRACUSE, N. Y.,  
F. W. Fischer,  
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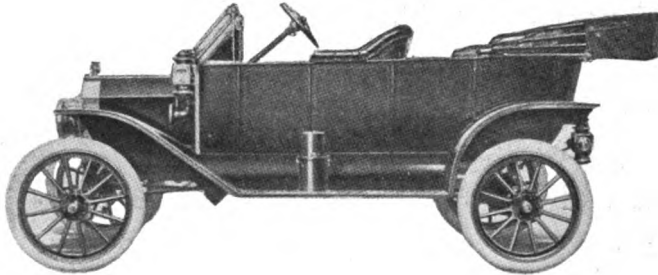
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THAT

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# YOU CANNOT A



## TO BE WITHOUT EAGLEINE NO — KARBON AUTO OIL

### THE OIL THAT SUITS AND DOES NOT SOOT

When a man buys a cheap article, he feels good when he pays for it, and then feels rotten while he's using it.

#### EAGLE OIL & SUPPLY CO

104 BROAD STREET

BOSTON MASS.

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# MOSSBERG


No. 15 SOCKET SET—  
ESPECIALLY MADE FOR  
**FORD CARS**

The Key to Successful Ford  
Operation



1914 List Price \$5.70



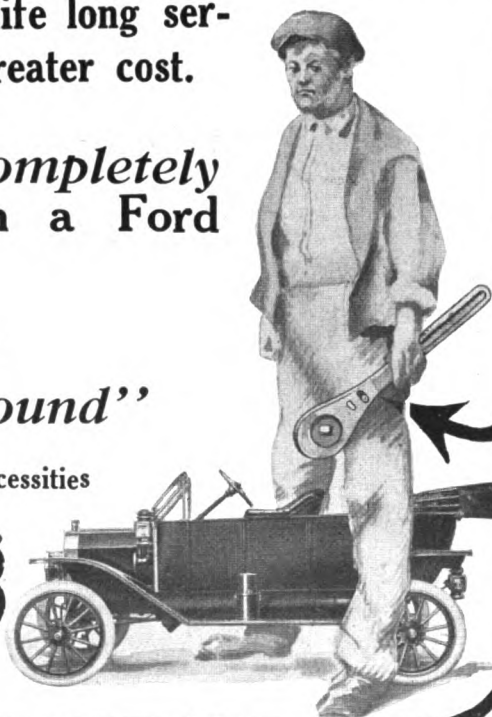
Any wrench or tool with  
the  trade mark means  
guaranteed life long ser-  
vice at no greater cost.

Mossberg Socket Set No. 15 *completely*  
*covers* the adjustments on a Ford  
automobile

*“Mossberg Wrenches  
Make Fords go round”*

Ask for your catalog 160—several clever Ford necessities

**Frank Mossberg  
Company,**  
ATTLEBORO, MASS.



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# 10 Automobile Mechanical Books 10

ENGINE—MAGNETO—CARBURETOR—BATTERY—ELECTRIC LIGHTING—TIRES—CHASSIS  
—OPERATION—OVERHAULING, BUILDING AND REPAIRING—THE MOTORCYCLE



## Automobile Mechanical Books

### A Library of Automobile Mechanical Information

800 Pages of Text—1500 Illustrations—All Copies Fully Indexed.

Knowledge of your car means additional pleasure in its use and decreased cost in operation and maintenance. The practical instruction that you need is to be found in these books, and to acquire the same fund of information in any other manner would require years of constant study. No car or component is neglected, and all standard engines, magnetos, carburetors, batteries, lighting systems and vehicles are dealt with. The full set includes:

|                                   |        |                                    |        |                                       |        |
|-----------------------------------|--------|------------------------------------|--------|---------------------------------------|--------|
| Engine . . . . .                  | \$ .35 | Motor Car Tires . . . . .          | \$ .25 | Magneto . . . . .                     | \$ .35 |
| Carburetor . . . . .              | .35    | The Motor Car Chassis . . . . .    | .25    | Motor Car Operation . . . . .         | .50    |
| Lighting by Electricity . . . . . | .50    | Motorcycle Construction, . . . . . |        | Overhauling, Rebuilding and . . . . . |        |
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Full Set, 10 Books . . . . . \$3.75

**JUST COMPLETED AND READY FOR SALE**

Motor Truck Construction, Operation, Care and Repair—Right up to the minute . . . . . \$1.00

A B C of Aerial Navigation . . . . . \$1.00

(Working Plans and Specifications of All Standard Models—American and Foreign Motors Described)

## The Automobile Journal Publishing Company

Times Building,

Pawtucket, R. I.



**BOSTON'S AUTOMOBILE SHOW.****Many Manufacturers Have Selected That Event for Their Initial Appearance.**

Since the first automobile show in Boston there have been a number of car and accessory producers who have awaited that event each year before making formal introduction of their wares to the public. Manager Chester I. Campbell reports that the 1914 display will be no exception in this regard.

As is always true of this biggest and best show of the season, the number of applications for space far exceeds the possibilities of Mechanics' building. Already, Manager Campbell and his able corps of assistants are busy in an attempt to devise some means of securing additional floor space.

The pleasure car show will be held March 7-14, and the truck display, March 17-21. A recent visit to the motorcycle exhibition in Chicago resulted in securing several additional exhibits of motorcycles for the Boston display, and this section will be much larger than has been true during the past two years. The new cycle-car division of the industry is also making a plea for a separate section.

The possibilities for business in connection with the New England exhibition are too well known to need amplification. It would appear, from such evidence as is obtainable at this time, that the manufacturers were more than ever convinced of this fact. The competition that has been engendered as a result is particularly pleasing to the show management, although it will require exceptional diplomacy to arrange the details to the satisfaction of all who desire to make display.

**SECURES DEWAR TROPHY.****Maker of Cadillac Car Wins Coveted Foreign Prize for the Second Time.**

The 1914 Cadillac, made by the Cadillac Motor Car Company, Detroit, has been awarded the Dewar trophy by the Royal Automobile Club of Great Britain. This prize, presented by Sir Thomas Dewar, is awarded annually to the motor car demonstrating the greatest achievement toward the advancement of the industry. This year's award marks the second time that the Cadillac car and America have received this acknowledgment.

The terms of the contest this year involved

the driving over 1000 miles of all sorts of roads, the thorough testing of fuel and oil consumption, the recording of the number of times the electric cranking device was used, the duration of the current for lights during and after the run and numerous other practical matters that have to do with efficiency and service.

**THE HAYNES CATALOGUE.****An Exceptionally Interesting Work of Art Prepared by Elwood Haynes.**

Something entirely new in the way of a motor car catalogue is that issued by the Haynes Automobile Company, Kokomo, Ind. It is entitled "The Complete Motorist", and comprises 80 pages, fully illustrated throughout in two colors. The front cover is of conventional design, embossed in two colors, while the company's trade mark, likewise embossed, appears on the fourth cover. Elwood Haynes, president of the company, and inventor of the original Haynes car in 1893, is the author.

The first chapter is devoted to an historical sketch of the first Haynes, now a government exhibit in the national museum in Washington, D. C. Chapter two explains in detail the latest Haynes models, and the function of each part is minutely described. There follows complete instructions for the operation and care of the machine, which include a very lucid explanation of the Vulcan electric gearshift. The fourth and closing chapter dwells chiefly on the merits of the Haynes and sets forth by forceful argument the reason it is worthy of the consideration of every prospective automobile owner.

James M. Carples of New York City was a visitor at the Olympia show in London, England, in the interests of the Sharrer one-hand top for automobiles, made by the Sharrer Patent Top Company, 245 West 55th street, New York City. It is understood that he will negotiate for the disposal of the European rights to this equipment before his return to this country.

Those in charge of preparations for the Importers' Automobile Salon, which will be held in the Hotel Astor, New York City, Jan. 2-10, announce that the new tariff law permits the entry of automobiles for exhibition purposes for a period of six months without the payment of duty. This is expected to have a decided influence upon the number and character of the exhibits at the forthcoming display.



### NEW MOTOR MANUFACTURER.

#### Concern Organized to Produce Engines Burning Low Grade of Fuel.

It is stated in Detroit that Harry S. Shaffer, formerly secretary and treasurer of the Keeton Motor Company, has retired from that concern, to become president of Shaffer Motor Manufacturing Company, incorporated at Alexandria, Va. The new concern will produce the Dunham motor, designed and patented by Herman E. Dunham on the Pacific Coast and brought to Detroit many months ago for experimental work.

Few details concerning the new engine are available, but it is understood that it will utilize the lower grades of fuel, and that it will possess features making for noiseless operation. Mr. Dunham, the inventor, will be actively interested in the company, which is said to have taken contract to equip sample cars for more extended observation and trial.

### TRANSFERRED TO NEW YORK.

#### Peerless Manager in Newark to Have Large Field of Usefulness.

Announcement has been made by E. J. Kulas, general manager of sales of the Peerless Motor Car Company, of the appointment of George H. Smith as general manager of the Peerless Motor Car Company of New York. The appointment of Mr. Smith follows five years of efficient service in the employ of the company as manager of the Newark branch, where he has been very successful in placing the Peerless trucks among the New Jersey manufacturers.

Mr. Smith has been in the automobile industry since 1902 and during this time he has been connected with the Packard, Cadillac and White cars, joining the Peerless forces in 1908. He will be assisted in New York by H. T. Birnie, who has been promoted from salesman to assistant manager.

### AN ALASKAN GARAGE.

#### Pacific Coast Manager for Studebaker Corporation Expects an Agent at Juneau.

While Alaska has not been entirely devoid of automobiles, it is true that it is only within comparatively recent months motor cars have been considered practical vehicles on the somewhat primitive ways of that division of the United

States. It was in September, 1911, that Dr. Charles G. Percival drove the first automobile the residents of Juneau, Alaska, had ever seen over its city streets, giving many of the inhabitants their initial experience of riding in a self-propelled vehicle, and later left Juneau for an overland trip to the Klondike region.

Now, Alaska is to have its first automobile salesroom and garage. A. H. Brown of Portland, Ore., who has charge of the Studebaker Corporation's wholesale business in the Pacific Northwest, reports that he has been importuned for some time, by letter and by a personal visit, by a man in Juneau to be permitted to represent the Studebaker car in that territory. The matter was taken up with the officials of the company recently and Mr. Brown has been authorized to close the deal.

### MANAGER PRUDEN RESIGNS.

#### Head of KisselKar New England Branch to Return to Old Home in Chicago.

Announcement is made by the KisselKar New England branch, Boston, Mass., that its manager, H. B. Pruden, has resigned, to take effect upon the appointment of his successor, or Dec. 1. This news will be received with deep regret by his many friends throughout this territory, made during his occupancy of the position during the past three years.

Mr. Pruden came to Boston from Chicago, and since taking charge of the New England branch he has succeeded in building up a large business for the pleasure cars and commercial vehicles made by the Kissel Motor Car Company, Hartford, Wis. In addition, he has erected, and the branch is now occupying, one of the most attractive and fully equipped automobile salesrooms and service stations in the East. This is located at 940 Commonwealth avenue, on Boston's new Automobile Row.

No announcement is made as to Mr. Pruden's future plans, further than the statement that he will return to Chicago, where he will again make his home.

As an aftermath of the recent increase in the capital stock of the Premier Motor Manufacturing Company, Indianapolis, Ind., several new men have entered the directorate of the company. The board is now constituted as follows: F. Barnickol, C. O. Baxter, A. L. Reeves, Clarence Stanley, H. O. Smith, Timanus J. Wilson and G. A. Weidely.



CONCERNING AUTOMOBILE RACING.

**Mercer Official Believes It Has Not Lost Its Usefulness or Popularity.**

That road racing and contests on specially constructed and guarded tracks is soon to resume its important place in the motor car industry is the opinion of W. A. Smith of the Mercer Automobile Company, Trenton, N. J. The abandonment of the Vanderbilt Cup and Grand Prize events by the Savannah Automobile Club was a decided disappointment to this company, which had entered two cars in each event.

Mr. Smith says that the French automobile manufacturers found the abandonment of racing to be a very expensive lesson and that they are now attempting to mend the break with the result that there are more road races and other forms of competition in that country this year than ever before. That the same conditions may be experienced in this country unless there is a change of plans is his belief. He adds that contests of this character have by no means lost their value to the industry.

It is the opinion of the Mercer people that next season will see a resumption of interest in racing, enabling the public to see contests that will sparkle with interest, consequently increasing the demand for the automobile. "The days of speedway contests and road races are bound to return, and the sooner the better for all concerned", concludes Mr. Smith.

The Motor Dealers' Contest Association, New York City, will promote a 500-mile reliability run Dec. 3-5. The first day's route lies over the Long Island roads; the second, in Westchester county, and the third, to Poughkeepsie and return.

COMING EVENTS.

**November.**

Nov. 27—Endurance run, Philadelphia, Penn.  
Nov. 27—Track meet, Bakersfield, Cal.

**December.**

Dec. 1-3—Annual meeting, American Automobile Association, Richmond, Va.  
Dec. 3-5—500-mile reliability contest, Motor Dealers Contest Association, New York.  
Dec. 6-13—Show, Toledo, O.  
Dec. 9-12—Convention, American Road Builders' Association, Philadelphia, Penn.  
Dec. 10-12—Convention, Retail Implement & Vehicle Dealers' Association, Milwaukee, Wis.  
Dec. 11-20—International exposition of safety and sanitation, American Museum of Safety, New York City.

**January.**

Jan. 2-10—Importers' Salon, Hotel Astor, New York City.  
Jan. 3-10—Pleasure car show, Grand Central Palace, New York City.

Jan. 4-8—Winter meeting, Society of Automobile Engineers, New York City.  
Jan. 10-16—Show, Milwaukee, Wis.  
Jan. 10-17—Show, Cleveland, O.  
Jan. 10-17—Show, Philadelphia, Penn.  
Jan. 10-21—Show, Brussels, Belgium.  
Jan. 12-17—Show, Bridgeport, Conn.  
Jan. 17-24—Show, Pittsburg, Penn.  
Jan. 17-24—Show, Detroit, Mich.  
Jan. 24-31—Pleasure car show, Montreal, Que.  
Jan. 24-31—Show, Rochester, N. Y.  
Jan. 24-31—Pleasure car show, Coliseum, Chicago, Ill.  
Jan. 26-31—Show, Scranton, Penn.  
Jan. 31-Feb. 7—Show, Minneapolis, Minn.

**February.**

Feb. 2-7—Pleasure car show, Buffalo, N. Y.  
Feb. 3-7—Commercial car show, Montreal, Que.  
Feb. 7-12—Show, Seattle, Wash.  
Feb. 9-14—Truck show, Buffalo, N. Y.  
Feb. 16-21—Show, Kansas City, Mo.  
Feb. 18-21—Show, Bloomington, Ill.  
Feb. 21-28—Show, First Regiment Armory, Newark, N. J.  
Feb. 21-28—Pleasure car show, Cincinnati, O.  
Feb. 23-28—Show, Omaha, Neb.

**March.**

March 2-4—Commercial car show, Cincinnati, O.  
March 2-6—Show, Fort Dodge, Ia.  
March 7-14—Pleasure car show, Mechanics' Building, Boston, Mass.  
March 9-14—Show, Des Moines, Ia.  
March 17-21—Truck show, Mechanics' Building, Boston, Mass.

**April.**

April 9-15—Show, Manchester, N. H.

**May.**

May 30—500-mile race, Indianapolis, Ind.

## THE REACTO

\$10.<sup>00</sup>


A vibrating Electric horn for automobiles. Not abruptly harsh but with a loud, sustained and penetrating note.



Send for  
Bulletin 158-J

No delicate parts  
Permanent adjustment  
Dust and waterproof

The Holtzer-Cabot Elec. Co., Brookline, Mass.  
Chicago, Ill.



**Aplco Electric Lighting System**

makes night riding safe and delightful. It is

"The right way to light the way."

Ask your dealer about it or write us.

**THE APPLE ELECTRIC COMPANY**  
74 Canal St., Dayton, Ohio

BOOKLET ON REQUEST

REPRESENTATIVES WANTED

# AUTOMOBILE TURNTABLES

THE T. C. BEACH CO.

106 Ottawa Street,

St. John, Mich



# "The Car of No Regrets"

## \$1095 with Equipment

Ward Leonard Starter and Generator  
for \$100 net additional

# KING

See the KING before you buy! It's fairness to yourself. You can't afford to purchase *any* car until this highest of motor values has been investigated. The KING gives *more* service, style, economy, power, riding comfort, conveniences and equipment than can be had in any car near its price, and has desirable, patented features which *no other* car can offer.

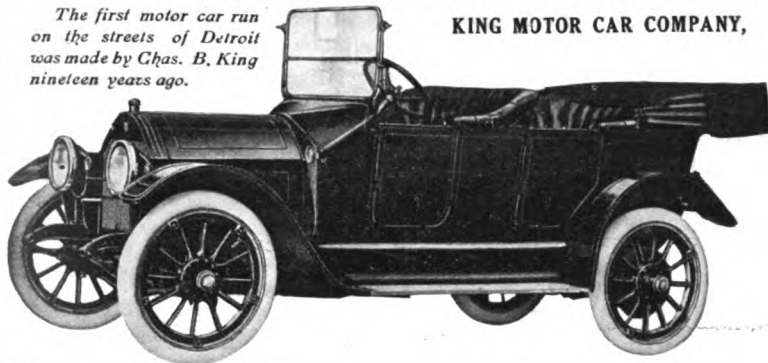
### FEATURES OF MODEL B, 30-35 HORSE-POWER

*Two Styles—One Chassis—Touring Car and Roadster*

|                         |                            |                         |                       |                      |
|-------------------------|----------------------------|-------------------------|-----------------------|----------------------|
| Cantilever Rear Springs | Three-point Suspension     | Full-floating Rear Axle | Hyatt Roller Bearings | Briggs Magneto       |
| Long-stroke Motor       | Gemmer Steering Gear       | Left-hand Steer         | Center Control        | Stromberg Carburetor |
| Unit Power Plant        | Complete Electric Lighting | 18-inch Steering-wheel  | 112-inch Wheel-base   | 20-inch Rear Doors   |

Rain-vision Ventilating Windshield; Silk Mohair Top; Quick-attachable Outrains; Quick-detachable and demountable Rims; Stewart Warner Speedometer (listed \$50); Electric Horn; Extra Rim; Tire-irons; Pump; Jack; Tire-repair Outfit; Tools, etc., all in regular equipment.

*The first motor car run  
on the streets of Detroit  
was made by Chas. B. King  
nineteen years ago.*



**KING MOTOR CAR COMPANY, 1300 to 1324 Jefferson Ave., Detroit, Mich.**

New York Agency and Showrooms,  
Broadway at 52d St.

New York Service Department,  
244 to 252 West 54th St.

#### AGENCY FOR CANADA

King Motor Sales Co. of Canada,  
London, Ontario

**ATTENTION, AGENTS!** Every KING sold sells others. If we could show the KING to every prospective purchaser of a moderate-priced car, we would sell a year's output monthly. In service and style, it far exceeds any car of its class. Write or wire today for territory.

Type 35  
Series J  
Racerabout  
Guaranteed  
Speed—Mile in  
51 Seconds



## MERCER

The car which most perfectly meets the medium weight demand. Dealers should carefully consider this fact.

*Write today regarding unallotted Territory.*

**MERCER AUTOMOBILE CO., 1100 Whitehead Road  
TRENTON, N. J.**

## CAMERON CARS \$975

All Up-To-Date Features

Four cylinder, water cooled, 30 H. P. Four forward speeds. 112 in. wheelbase. Left hand drive, centre control. Starts from seat. Pointed hood, beautiful lines and finish. Equipment unsurpassed at the price.

*Write for full details and terms to agents*

**THE CAMERON MANUFACTURING CO. West Haven, Ct.**

# Tarvia

**PREVENTS DUST  
PRESERVES ROADS**

*Booklets on request*

**BARRETT MANUFACTURING CO.**

New York, Chicago, Philadelphia, Boston, St. Louis, Cleveland, Pittsburgh, Cincinnati, Kansas City, Minneapolis, Corey, Ala.

Discard the Hand Pump. Join the Satisfied Army. Get a

## Brown Impulse Tire Pump

Write for information to

**The Brown Company,**

1075 S. Clinton St.,

Syracuse, N. Y.



The Thoroughbred Car.

Live wire dealers, write for unallotted territory.

**HERRESHOFF MOTOR COMPANY, Detroit, Mich.**

Electric self-cranking, electrically lighted.  
Four Forward Speeds.

"Six Thirty-Six" Touring  
Car and Roadster - \$1850  
Model 30 Touring Car - \$1350  
Model 30 Roadster - \$1250



**YOU CAN SAVE 15 PER CENT**

of your insurance premium every year by installing a Pyrene Fire Extinguisher in a convenient and conspicuous place on the dash-board of your automobile. For further particulars address

**PYRENE COMPANY OF NEW ENGLAND**

176 Federal Street, Boston, Mass.

**Subscribe for**

**The Accessory and Garage Journal**

**The Trade Authority \$2.00 a year.**

**When Writing to Advertisers, Please Mention The Automobile Journal.**



# The "Black Eagle" Spark Plug

PATENTED

## 50 Cents Is Enough

The "Black Eagle" Spark Plug has made good because it was designed and manufactured with this result in view.

A person in close touch with the supply and manufacturing ends of the trade was a visitor at our factory recently, and was shown the details of construction, including the machinery, testing, and assembling of the "BLACK EAGLE" Spark Plug. What he said we believe will be of interest to you, as it indicates the effort on our part to supply a high grade plug at a reasonable price. We therefore quote below his impressions.

"I am simply amazed at the workmanship, material, and construction of the 'BLACK EAGLE' Spark Plug. When I saw this plug advertised at a price of 50c to the consumer, I naturally supposed it was a cheap, common, plug such as you occasionally find in jobbing houses on the bargain counter. I am convinced, after seeing these plugs tested, and examining minutely the machine parts which enter into their construction, that no better porcelain spark plug is offered by any one, regardless of the price they ask."



We are not influenced by what our competitors charge for spark plugs! We have ignored price precedent, for the reason that a high grade spark plug can be manufactured and sold at 50c each, and that is enough.

Sent prepaid on receipt of price. Made in all standard threads.

### THE STANDARD CO.

### Torrington, Conn., U. S. A.

#### THE "SIX-48" KEETON

REPRESENTS

The "finer points" of EUROPEAN DESIGN

\$3250 Completely Equipped

Interesting literature sent on request

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467 Lawton Ave.,

Detroit, Mich.

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THE 10% OVERWEIGHT TIRES

Guaranteed for 4000 Miles Service

Measured by Mileage, the Cheapest Shoes Ever Made. Clincher and Quick Detachable, Plain and Break-Skid Treads, Regular and Metric Sizes, for All Standard Rims.

**THE CATARACT RUBBER COMPANY**

Boston, New York, Providence.

Factory: WOOSTER, O.



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A Cole franchise is a valuable asset to any dealer. Find out about it.

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### SUBSCRIBE FOR THE MOTOR TRUCK

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Harold J. Gross, James H. Hurley and E. Tuccer Gross, Auctioneers

## AUCTION SALE

By Wm. B. Greenough, Trustee in Bankruptcy of the Standard Wrench and Tool Company,

**Tuesday, December 9th, 1913** At 12 o'clock noon on the premises,  
**Massasolet Avenue, East Providence, R. I.**

Property of the

**STANDARD WRENCH & TOOL COMPANY**

Including Land, Buildings and Machinery Equipment  
TO BE SOLD IN ONE PARCEL.

**BUILDINGS**—Main Building, brick, 102.5x40 ft., two stories; elevator.

Drop Forge Building, brick, 102.5x50 ft.

Power House, brick, 31x19 ft.

Pickling House, frame, 44.5x31 ft.

Four other frame buildings.

**POWER PLANT**—1 75 H. P. Diesel Engine.

7 Motors, aggregating 163 H. P.

1 150 H. P. Horizontal Tubular Boiler.

**LAND**—The land fronts about 450 ft. on Massasolet avenue, 315 ft. on Aldrich street, 450 ft. on the New York, New Haven and Hartford Railroad; area, 112,000 sq. ft.

**MACHINERY EQUIPMENT** for the manufacture and finishing of drop forgings, from the smallest up to and exceeding 100 lbs. in weight, and for the manufacture of wrenches and small tools of a similar nature; also for the manufacture of "Fitzall" wrenches, 6 in., 7 in., 8 in., 10 in., 12 in., hand wrenches; 7 in., 10 in., 12 in., 14 in., pipe wrenches. The machinery equipment is up-to-date and in excellent condition.

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| <b>Dover Soap Economiser</b><br><br>Saves over one-third soap consumption | <b>Dover Electric Light Bulb Case</b><br>Safe and Very Compact<br><br>Send for 1913 Catalogue | <b>DOVER SAVAL MEASURE AND FUNNEL</b><br><br>With Automatic Shut-Off Prevents Overflowing Oil Tank |
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| Six Cylinder<br>65 H. P.<br>Equipped with Valcan Electric Gear Shift | <br>America's First Car | Four Cylinder<br>48 H. P.<br>Equipped with Valcan Electric Gear Shift |
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Our advertising campaign will send a buyer into your showroom more than half convinced that he should own a Haynes; the sale, however, results only from a successful demonstration; it is our firm belief that, as a Haynes dealer, you possess more than a sufficient number of convincing arguments to make every demonstration result in a quick and profitable sale.

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**THE HAYNES AUTOMOBILE COMPANY**  
 6 Main St., Kokomo, Indiana.

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|  | Bay State Antokit, No. 1, \$10<br>Bay State Antokit, No. 2, \$7.50<br>Bay State Stickit, \$3<br><b>GEO. A. CUTTER, Sales Agent</b><br>Taunton, Mass. |
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|  | <b>GEISZLER NON-SULPHATING STORAGE BATTERIES</b><br>Guaranteed perfect satisfaction or money refunded<br><b>SIZE 66 - \$20.00</b><br><b>GEISZLER BROS. STORAGE BATTERY COMPANY</b><br>514 West 57th Street, New York City |
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| INSIST ON GETTING<br><b>Colonial Motor Oil</b><br>No substitute "just as good"<br><b>Borne, Scrymser Company</b><br>NEW YORK BOSTON FALL RIVER PHILADELPHIA |
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| <b>"THE WELDING" COMPANY</b><br>SPRINGFIELD BOSTON HARTFORD HOLYOKE<br>BRIDGEPORT SALEM<br>All Parts of Any Metal Welded and Guaranteed<br>ALUMINUM CASES AND CAST IRON CYLINDERS A SPECIALTY |
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| <b>GYROSCOPE PRINCIPLE</b><br>The New Jones Speedometer Unaffected by Heat or Cold<br>Any motor car maker will equip with it if you state plainly you want nothing else, no matter what speedometer he may list in his catalog as equipment.<br>Write us for facts, test and experiments that show Jones supremacy beyond question.<br><b>THE JONES SPEEDOMETER—Broadway at 76th Street, NEW YORK</b> |
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| The Easiest Riding Car in the World<br><br>NEW SERIES MARMON "32" \$2850 to \$4100<br>THE MARMON SIX \$5000 to \$6350<br><b>NORDYKE &amp; MARMON CO., Indianapolis, Ind.</b> | Thoroughly expressive of the highest development of automobile design, materials and construction.<br>F. E. WING MOTOR CAR CO. "Motor Mart"<br>12 Columbus Ave., BOSTON<br>New England Dealers for |
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| <br>This name on Automobile Tires and Rubber Accessories signifies inherent qualities of material and workmanship that insure the maximum of service at the minimum of expense.<br><b>THE GOODYEAR TIRE &amp; RUBBER COMPANY, AKRON, OHIO (678)</b> |
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# Classified Buyers' Guide

## A Handy Reference for Purchasers

### ACCESSORY MANUFACTURERS AND JOBBERS.

**Auto Parts Co.,** Providence, R. I.

**Hopewell Brothers,** Newton, Mass.

Branch: 1974 Broadway at 67th St., New York.

**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City.

**Miller, Chas. E.,** 97-103 Reade St., New York.

Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave. and 2782 Broadway, New York; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 259 Peachtree St., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.

**Milwaukee Auto Specialty Co.,** 128 Second St., Milwaukee, Wis.

**Motor Parts Co.,** 185-187 Columbus Ave., Boston; 818 No. Broad St., Philadelphia; Springfield, Mass.

**Northwestern Chemical Co.,** Marietta, O.

**Waite Auto Supply Co.,** 81 Exchange place, Providence.

### ACETYLENE TANKS. (See Tanks.)

### AIR COMPRESSORS AND TANKS.

**Williams Foundry & Machine Co.,** Akron, O.

### AMMETERS AND VOLTMETERS.

**Hoyt Electrical Instrument Works,** Penacook, N. H.

### AUTOMOBILES. (See Cars.)

### AUTOMOBILE SPECIALTIES.

**Cox Brass Mfg. Co.,** Dudley Ave., Albany, N. Y. (Brass Goods.)

### BALLS AND BALL BEARINGS.

**Boyd, F. Shirley,** 903 Boylston St., Boston. (R. I. V.)

**Hyatt Roller Bearing Co.,** Detroit.

**Marburg Bros., Inc.,** 1790 Broadway, New York. (S. R. O.)

**New Departure Mfg. Co.,** Bristol, Conn.

**Rhineland Machine Works Co.,** 140 W. 42nd St., New York City.

Branches: 1254 Michigan Ave., Chicago, 650 Woodward Ave., Detroit; 1424 Vine St., Philadelphia; 220 Motor Mart, Boston.

**R. I. V. Co.,** 1771 Broadway, New York. (R. I. V.)

### BATTERIES.

**Electric Storage Battery Co.,** Philadelphia. (Exide.)

**Gelsner Bros. Storage Battery Co.,** 514 W. 57th St., New York.

**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City. (J-M.)

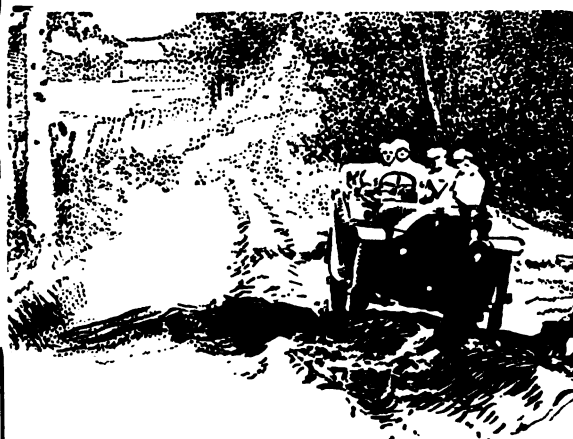
**Waite Auto Supply Co.,** 81 Exchange place, Providence. (Success.)

### BATTERY EXTINGUISHERS.

**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City.

(Continued on Next Page.)

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## Get Every Mile

that your gasoline has in it.

# Polarine

## The Frost-Proof Oil

puts the power in the drive wheels—all of it. Polarine ends carbon troubles, stops friction, flows freely down to zero temperature and makes repair bills shrink.

Polarine your car.

In half-barrels and barrels, gallon and five-gallon cans.



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**STANDARD  
OIL COMPANY**  
OF NEW YORK





Stutz owners never say "I drive a car"—they always say—

**"I drive a Stutz"**

If you are a Stutz owner you know this to be true. When you get your Stutz, if you do not own one now, you will say it, too.

### Stutz owners are Stutz Boosters

You will never live to see the day when a Stutz owner will apologize because he drives a Stutz—he is justly proud of his selection.

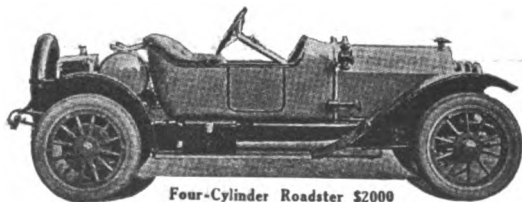
In buying a car, don't do yourself the injustice of making a selection without first seeing the four and six-cylinder Stutz in the new models.

You won't find any radical mechanical changes—they were not necessary. Just a few touches here and there have been added—more generous upholstery, springs a little longer, with greater service and power.

Write for our new illustrated catalog No. A-5—Series E.

Dealers: We still have a little desirable territory open. Write or wire quick.

**Stutz Motor Car Company**  
of Indianapolis



Four-Cylinder Roadster \$2000  
Six-Cylinder Roadster \$2250

STUTZ — the car that made good in a day

STUTZ — the car that made good in a day

## (BUYERS' GUIDE—Continued.)

### BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

### BRAKE BANDING OR LINING.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (J-M Non-Burn.)

Standard Woven Fabric Co., Framingham, Mass. (Multibestos.)

Branches: F. Shirley Boyd, 903 Boylston St., Boston; C. D. Schmidt, 276 Canal St., New York City; N. A. Petry Co., 1427 Vine St., Philadelphia; F. E. Sparks, 1430 Michigan Blvd., Chicago; Fred Ward & Son, San Francisco.

### BRUSHES, WIRE.

Williams Foundry & Machine Co., Akron, O.

### BUMPERS AND FENDERS.

Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

### CABLES. (See Wires.)

CARBON REMOVERS. (See Cylinder Cleaning Compound.)

### CARS—ELECTRIC PLEASURE.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)

Baker Motor Vehicle Co., Cleveland. (Baker.)

### CARS—GASOLINE PLEASURE.

Austin Automobile Co., Grand Rapids, Mich. (Austin.)

Cameron Mfg. Co., West Haven, Conn. (Cameron.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Cole Motor Car Co., Indianapolis, Ind. (Cole.)

Empire Automobile Co., Indianapolis, Ind. (Empire, Little Aristocrat.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Herreshoff Motor Co., Detroit. (Herreshoff.)

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Keeton Motor Co., Detroit. (Keeton.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

Maxwell Motor Co., Inc., Detroit. (Maxwell.)

Mercer Automobile Co., 1100 Whitehead Road, Trenton, N. J. (Mercer.)

Moline Automobile Co., E. Moline, Ill. (Moline.)

National Motor Vehicle Co., 1033 22nd St., Indianapolis. (National.)

Nordyke & Marmon Co., Indianapolis. (Marmon.)

Owen & Co., R. M., 19 W. 62nd St., New York City. (Reo.)

Paige-Detroit Motor Car Co., Detroit. (Paige.)

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Studebaker Corp., Detroit. (Studebaker.)

Stutz Motor Car Co., Indianapolis. (Stutz.)

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**(BUYERS' GUIDE—Continued.)**

**White Co., The**, 828 E. 79th St., Cleveland. (White.)  
**Branches:** 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

**Willys-Overland Co.**, Toledo, O. (Overland.)

**CARS—STEAM PLEASURE.**

**White Co., The**, 828 E. 79th St., Cleveland. (White.)  
**Branches:** See Cars—Gasoline Pleasure.

**CARS—GASOLINE COMMERCIAL.**

**Adams Bros. Co.**, Findlay, O. (Adams.)  
**Bessemer Motor Truck Co.**, Grove City, Penn. (Bessemer.)  
**Blair Mfg. Co.**, Newark, O. (Blair.)  
**Cartercar Co.**, Pontiac, Mich. (Cartercar.)  
**Dart Manufacturing Co.**, Waterloo, Ia. (Dart.)  
**Driggs-Seabury Ordnance Corp.**, Sharon, Penn. (Vulcan.)  
**Federal Motor Truck Co.**, Junction and Leavitt Sts., Detroit. (Federal.)

**Garford Co.**, Elyria, O. (Garford.)  
**General Motors Truck Co.**, 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)  
**Branches:** New York, Chicago, Boston, Philadelphia, Kansas City.

**Gramm-Bernstein Co.**, Lima, O. (B. A. Gramm's.)  
**Knox Automobile Co.**, Springfield, Mass. (Knox and Martin Tractor.)

**Owen & Co.**, R. M., 19 W. 62d St., New York City. (Reo.)  
**Pierce-Arrow Motor Car Co.**, Buffalo, N. Y. (Pierce-Arrow.)

**Reo Motor Car Co.**, Lansing, Mich. (Reo.)  
**Studebaker Corp.**, Detroit. (Studebaker.)  
**Sullivan Motor Car Co.**, 1707 East Ave., Rochester, N. Y. (Sullivan.)

**Willet Engine & Truck Co., Inc.**, 8-10 Lock St., Buffalo. (Willet.)

**Willys-Overland Co.**, Toledo, O. (Overland.)

**CARS—ELECTRIC COMMERCIAL.**

**Anderson Electric Car Co.**, 458 Clay Ave., Detroit. (Detroit Electric.)

**Atlantic Vehicle Co.**, Factory, Newark, N. J.; 1600 Broadway, New York City; 10 Postoffice Sq., Boston. (Atlantic.)

**Baker Motor Vehicle Co.**, Cleveland. (Baker.)

**Couple-Gear Freight-Wheel Co.**, 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)  
**Branches:** 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.

**General Motors Truck Co.**, 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)  
**Branches:** See Cars—Gasoline Commercial.

**General Vehicle Co.**, Long Island City, N. Y. (G. V.)

**CARS—FIRE, POLICE AND MUNICIPAL SERVICE.**

**Cartercar Co.**, Pontiac, Mich. (Cartercar.)

**Couple-Gear Freight-Wheel Co.**, 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)  
**Branches:** See Cars—Electric Commercial.

**Knox Automobile Co.**, Springfield, Mass. (Knox and Martin Tractor.)

**White Co., The**, 828 E. 79th St., Cleveland. (White.)  
**Branches:** See Cars—Gasoline Pleasure.

**Willys-Overland Co.**, Toledo, O. (Overland.)

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**J. M. Shock Absorber**

Get your wife  
this Christmas gift



Year-round comfort to every one who sits on the rear seat. Till you ride there yourself, you'll never know how much your car needs

**J. M. Shock Absorbers**

The Ovington Data Chart "D" shows how the car jumps and jerks on all sorts of roads till **J. M. Shock Absorbers** are put on the rear springs. Then—as these lines drawn by the car itself prove—every jolt is minimized, every nerve-racking shock eliminated. Send today for this chart—it is free. But the edition is limited.

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**Main Office and American Factory,**  
**210 S. 17th St. Philadelphia, Pa.**

*Branches all over the world.*

**Branches in U. S. A.:** Albany, N. Y.; Altoona, Pa.; Atlanta, Ga.; Atlantic City, N. J.; Baltimore, Md.; Boston, Mass.; Brooklyn, N. Y.; Buffalo, N. Y.; Chicago, Ill.; Cincinnati, O.; Cleveland, O.; Dallas, Tex.; Erie, Pa.; Hartford, Conn.; Houston, Tex.; Indianapolis, Ind.; Jacksonville, Fla.; Kansas City, Mo.; Los Angeles, Cal.; Minneapolis, Minn.; Newark, N. J.; New Orleans, La.; New York, N. Y.; Orlando, Fla.; Pittsburgh, Pa.; Pottstown, Pa.; Providence, R. I.; St. Louis, Mo.; San Francisco, Cal.; Springfield, Mass.; Trenton, N. J., and Washington, D. C.







The performance of Eisemann Ignition Systems during the Indiana-Pacific Tour justifies every claim we have ever made for Eisemann efficiency and dependability.

**The Eisemann Magneto Company**  
 Sales and General Offices  
 225-227 West 57th St., New York  
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*National*

**FIVE MODELS STOCK CHAMPION**  
 Electric Starter - \$2750 to \$3400  
 Electric Lights  
**National Motor Vehicle Co., Indianapolis**

**EVERYTHING FOR THE AUTOMOBILE**

**WAITE AUTO SUPPLY CO.**  
**Manufacturers and Jobbers**  
**81 Exchange Place Providence, R. I.**

*Studebaker*

"Accessibility of the motor a leading feature"  
 "25"—\$885 "35"—\$1290 "SIX"—\$1550  
 All prices for cars fully equipped F. O. B. Detroit.  
**STUDEBAKER, - - - DETROIT, MICH.**

**J-M AUTOMOBILE SUPPLIES**

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| Brake Lining     | Friction Tape      | Packings    |
| Spark Plugs      | Fire Extinguishers | Cements     |
| Dry Batteries    | Radiator Shields   | Fuses       |
| Lighting Systems | Speedometers       | Horns, Etc. |

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 NEW YORK AND EVERY LARGE CITY

## Cartercar

With the gearless transmission—will give better service than is possible for a gear car. Unlimited speeds—climbs steep hills—gives double the usual tire mileage.

**CARTERCAR COMPANY, Pontiac, Mich.** Send for catalog

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**Johns-Manville Co., H. W.,** Madison Ave. and 41st St., New York City.  
**Northwestern Chemical Co.,** Marietta, O. (Se-ment-ol Ra-diator.)

### CHAINS, TIRE AND ANTI-SKIDDING DEVICES.

**Weed Chain Tire Grip Co.,** 28 Moore St., New York.

### CHAINS—TRANSMISSION OR DRIVING.

**Boyd, F. Shirley,** 903 Boylston St., Boston. (Baldwin.)  
**Miller, Chas. E.,** 97-103 Reade St., New York. (Brampton.)  
 Branches: See Accessory Manufacturers and Jobbers.

### COILS.

**Helme Electric Co.,** Lowell, Mass.

### CYLINDER CLEANING COMPOUND.

**Cox Brass Mfg. Co.,** Dudley Ave., Albany, N. Y.  
**Milwaukee Auto Specialty Co.,** 128 Second St., Milwaukee.  
**Northwestern Chemical Co.,** Marietta, O. ((Carbonox.))  
**Prest-O-Lite Company,** 271 East South St., Indianapolis.  
 (Prest-O-Carbon Remover.)  
 Branches: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

### FIRE EXTINGUISHERS.

**Johns-Manville Co., H. W.,** Madison Ave. and 41st St., New York City.  
**Northwestern Chemical Co.,** Marietta, O. (Fire-Fly.)  
**Pyrene Co. of New England,** 176 Federal St., Boston.

### FUNNELS.

**Dover Stamping & Manufacturing Co.,** Cambridge, Mass. (Dover.)

**GARAGES, PORTABLE.** (See Houses, Portable Steel.)

### GASKETS AND GASKET CUTTERS.

**Brown Co., Inc., Chas. D.,** 49 Federal St., Boston. (Vel-lumold.)  
**Shawver Co.,** Springfield, O.

### GEARS, STEERING.

**Ross Gear & Tool Co.,** 794 Heath St., Lafayette, Ind.

**GUNS, GREASE.** (See Oil Pumps.)

### HORNS.

**Dean Electric Co.,** Elyria, O. (Tuto.)  
**Johns-Manville Co., H. W.,** Madison Ave. and 41st St., New York City.  
**Kent Mfg. Works, Atwater,** 4937 Stenton Ave., Wayne Junction, Philadelphia. (Monoplex.)

### HOUSES, PORTABLE STEEL.

**Kolb Sales Co.,** 1790 Broadway, New York. (Ruby.)  
 (Continued on Next Page.)



(BUYERS' GUIDE—Continued.)

IGNITION EQUIPMENT.

Kent Mfg. Works, Atwater, 4937 Stenton Ave., Wayne Junction, Philadelphia.

INSULATION.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

JACKS, ETC.

Shawver Co., Springfield, O.

LAMP COVERS.

Hopewell Brothers, Newton, Mass. (Hopewell.)  
Branch: 1974 Broadway, New York.

LIGHTING SYSTEMS, ELECTRIC.

Apple Electric Co., Dayton, O. (Aplico.)  
Dean Electric Co., Elyria, O. (Dynalux.)  
Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.  
Remy Electric Co., Anderson, Ind. (Remy.)

LUBRICANTS.

Borne, Scrymser Co., 80 South St., New York. (Colonial.)  
Branches: Boston, Fall River, Philadelphia.  
Dixon Crucible Co., Jos., Jersey City, N. J., (Graphite.)  
Eagle Oil & Supply Co., 104 Broad St., Boston. (Eagle-line No-Karbon.)  
Harris Oil Co., A. W., 326 South Water St., Providence. (Harris.)  
Branch: 143 No. Wabash Ave., Chicago.  
Haws, Geo. A., 148 Front St., New York. (Panhard.)  
Branch: 899 Boylston St., Boston.  
Indian Refining Co., 17 Battery Place, New York. (Distributors of Havoline Oil.)  
Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Building, Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.  
Invader Oil Co., 80 Broad St., New York. (Invader.)  
Branches: 284 Columbus Ave., Boston; 113 Arch St., Philadelphia; 512 Kenois Bldg., 11 and G Sts., N. W., Washington, D. C.  
Miller, Chas. E., 97-103 Reade St., New York. (Pan-American.)  
Branches: See Accessory Manufacturers.  
New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)  
Northwestern Chemical Co., Marietta, O. (Gear-Silence.)  
Standard Oil Co., New York. (Polarine.)  
Branches: In all cities.  
Texas Company, The, 7 West St., New York.  
Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo.  
Vacuum Oil Co., Rochester, N. Y. (Mobiloil.)  
Tulsa, Houston.  
Branches: 49 Federal St., Boston; 29 Broadway, New York; Fourth and Chestnut Sts., Philadelphia; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.; Fisher Bldg., Chicago; Ford Bldg., Detroit; Indiana Pythian Bldg., Indianapolis.  
Valvoline Oil Co., 27 State St., Boston. (Valvoline.)

MAGNETOS AND SUPPLIES.

Bosch Magneto Co., 223-225 W. 46th St., New York.  
(Continued on Next Page.)

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SAGER EQUALIZERS

The Shock Absorbers Which Save Your Car and Tires. Nothing to Wear, Adjust or Require Attention. They Take The "Sting" Out of Rough Roads. Try Them At Our Expense For 30 Days.

Seven Years Of Success.

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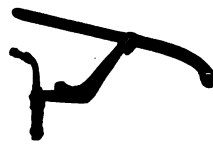
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(Continued on Next Page.)



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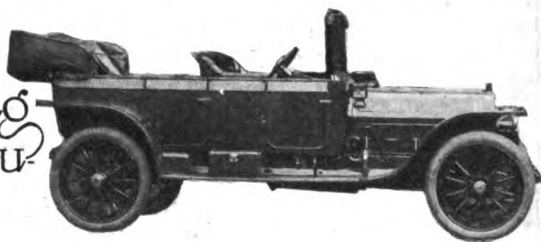


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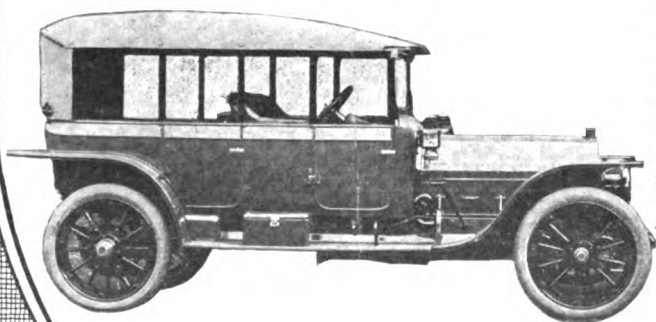


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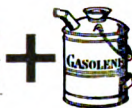
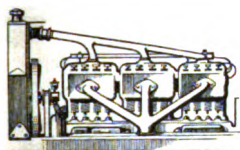


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PAWTUCKET R.I.

December 10, 1913



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*Only oil whose "body," or thickness, is suited to your feed system can properly feed to the friction points.*

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A grade for each type of motor.

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Gargoyle Mobiloil "B"  
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They are put up in 1 and 5 gallon sealed cans, in half-barrels, and barrels. *All are branded with the Gargoyle, which is our mark of manufacture.* They can be secured from all reliable garages, automobile supply stores, and others who supply lubricants.

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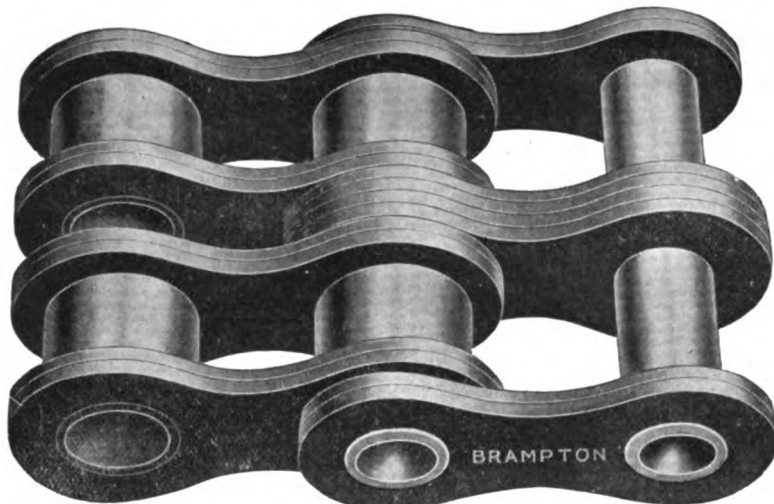
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ON AUTOMOBILES AND ALL KINDS OF MACHINERY

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THIS COMPOUND ROLLER CHAIN, 2 $\frac{1}{4}$ " PITCH, HAS BREAKING LOAD OF 40 TONS.

Several Good Chains on the market, but

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**Also to All Owners of Stoddard-Dayton, 1905 to 1914; Columbia Gasoline and Electrics, 1906 to 1914; Everitt Cars of Any Model; Brush, Sampson and Courier Cars**

THERE ARE THREE GOOD REASONS why you should have your car overhauled now and worn parts replaced.

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**THIRD:** And perhaps the best reason why you should secure your requirements now—we must increase prices 20% January 1st, when the new parts price lists will be off the presses.

**NOW NOTE THIS—**Never before in the history of this industry has a new concern, having bought the plants and assets of a bankrupt one, taken upon itself the obligation of furnishing replacement parts for the cars it never made.

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**WE'VE INVESTED** about one and three-quarter million dollars (\$1,750,000) in a plant and stock of parts, for over 150 different models, made by the concerns that comprised the United States Motor Company, whose assets were purchased from the Receiver thru the U. S. Courts.

**WE TOOK THE NAME MAXWELL** solely for the protection of 60,000 persons who had bought cars under that name.

**HAD WE CHOSEN ANOTHER NAME** those 60,000 cars would have had almost no value in the second-hand market. As it is, they have a definite value. And by the replacement of the worn parts your car will be good for a long time to come.

**ANY RECOGNIZED DEALER** or repair man—whether he handles the present Maxwell line or not—can procure these parts for you. Or you can order direct. Shipment will be made within 24 to 48 hours after receipt of the order at Newcastle.

Write for our booklet, "How to Make Your Car Live Twice As Long," in which we set forth the Maxwell policy toward owners of the above mentioned cars. Address

**Maxwell Motor Co., Inc.**  
**DETROIT, MICH.**

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# Why The Austin Is Superior

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We will be pleased to answer any questions relative to the construction and merits of our special and exclusive features, and to give any further information that may be desired.

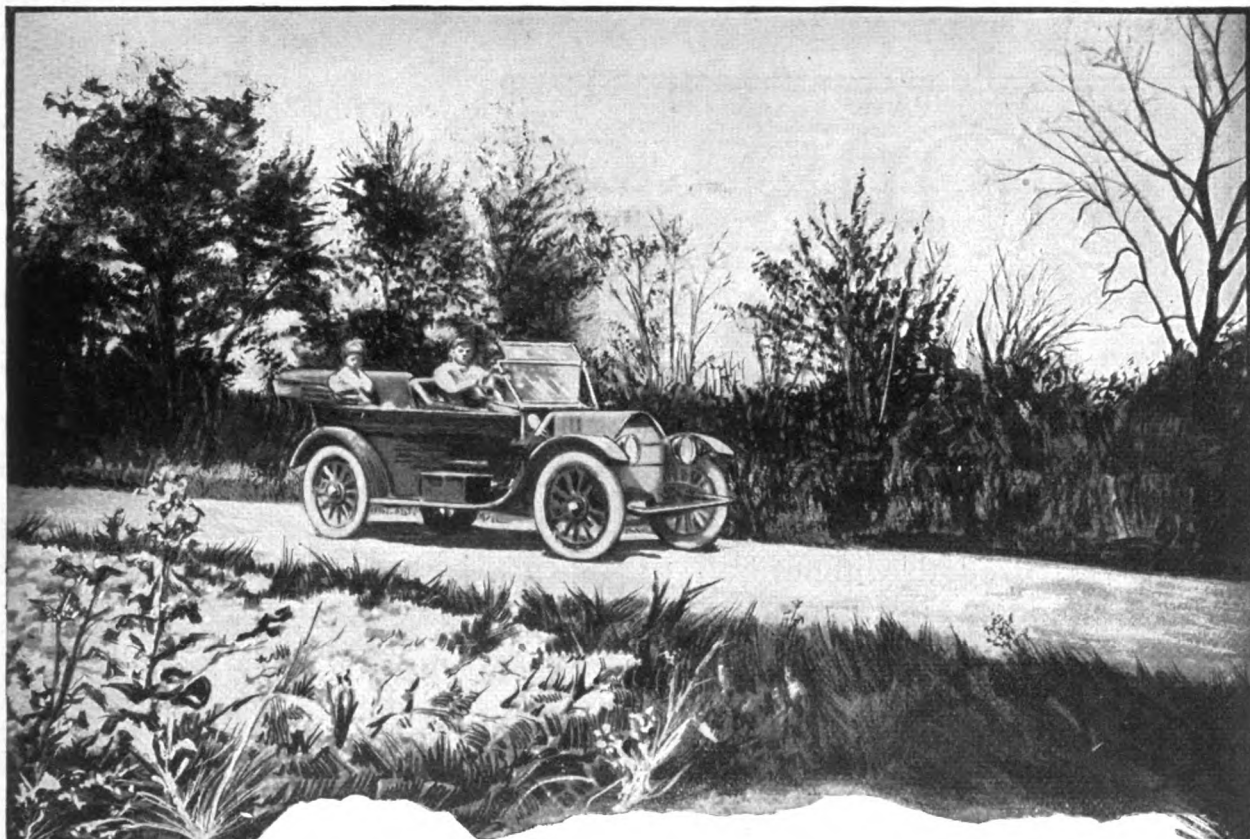
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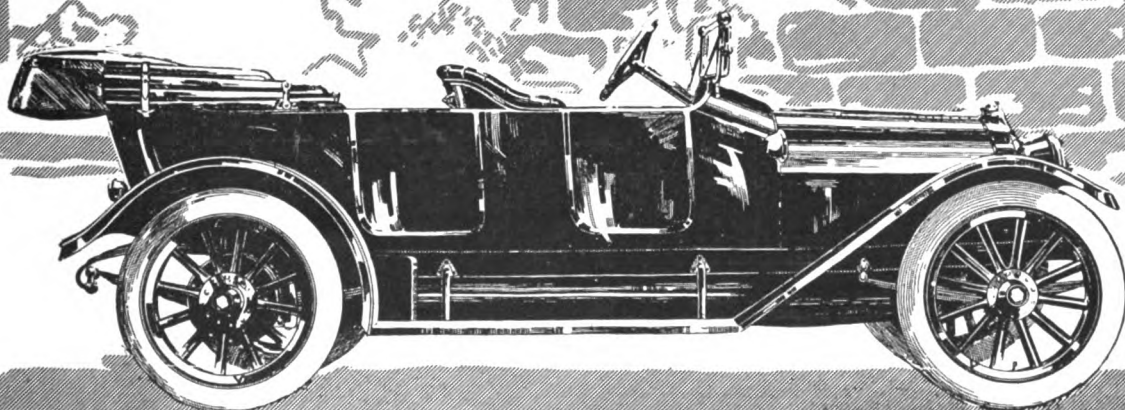
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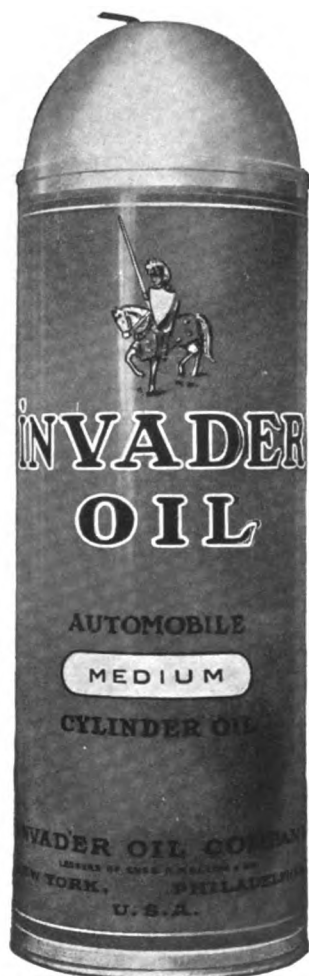
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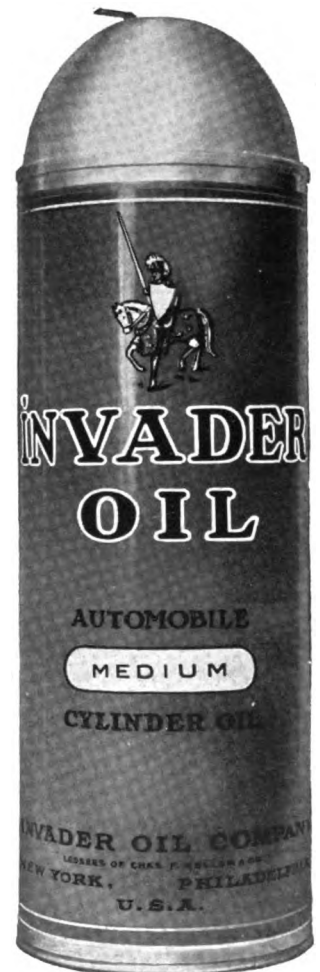
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## THE OIL THAT SUITS AND DOES NOT SOOT.

Carbon in your cylinders means loss of power. Customers report 10,000 to 15,000 miles with no carbon troubles. A good motto: TRY ANYTHING ONCE. EAGLEINE NO-CARBON AUTO OIL is furnished in 1-5-10 gallon, 30 and 50 gallon Steel Drums with faucets for which no extra charge is made.

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## The Automobile Journal Publishing Company

Times Building,

Pawtucket, R. I.



## PUBLISHER'S COMMENT.

The Issue of The Automobile Journal for Dec. 25 will be devoted to the first National Automobile Show of 1914, which will be seen at Grand Central Palace Jan. 3-10. It will be largely given over to description of the exhibits that will be seen at this exhibition, which will be the 14th held in the Metropolis. Every detail of interest to motorists will be considered and the features of the vehicles will be described and illustrated.

The Importance of the Eastern Motor Vehicle Market, which includes machines, equipment, accessories, supplies and the like, is realized by the entire industry, and for years the show has been marked for the features, refinements and improvements which are displayed for the first time. The New York Show is first in importance with the industry. The coming exhibition will have greater prominence than ever before. The Dec. 25 edition of The Automobile Journal will advise its readers fully of what can be seen at the show. The issue of Jan. 10 will be given over to a review of the exhibition, and the two numbers will constitute a complete reference for a buyer who seeks general or specific information of any character. They will have particular value and will be preserved. You can obtain the full benefit of these issues by subscription, either direct or through your news dealer.

Our Series of Mechanical Handbooks would be particularly appreciated by any young man who is desirous of familiarizing himself with the mechanical details of motoring. They are written in an interesting, non-technical manner, and fully illustrated, so that the novice is able to understand the facts presented. The price for the set of 10 books is \$3.75, or with a year's subscription to The Automobile Journal, \$4.75.

The Buyers' Guide on Pages 87-96, contains the names and addresses of reliable concerns engaged in the manufacture and sale of pleasure and commercial cars, and their accessories, supplies and fittings. Always consult it when in need of anything new.

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# We Prove It at the Shows



THE GRIP  
MULTIBESTOS  
BRAKE THAT GRIPS LINING

Every Salesman of brake lining has a few stock phrases that he uses continually in arguing for the quality and merit of his particular brand. Heat resistance; coefficient of friction; extreme durability---these and many others are among the features which are spoken of so often, and at times so loosely. One calls his "the original"; another flatly declares his "the best".

We have made several claims ourselves and

now that we have the opportunity we mean to prove these claims and back up our widest statements with substantial proof.

At all three of the big shows we will have on exhibition a mechanical device which will be driven by a friction wheel made of Multibestos. There will be a brake drum attached and the band will be lined with Multibestos. By this device we can show exactly what Multibestos will do.

There will be no guess-work about it---no loose statements; but there will be definite and absolute proof that every feature which goes to make a good brake lining is found in the highest degree in MULTIBESTOS.

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**Standard Woven Fabric Co.**  
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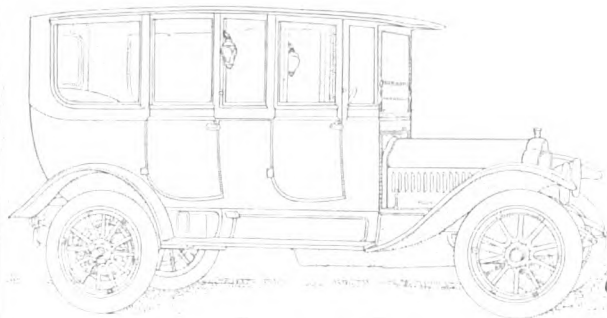




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For its absolute correctness of construction, for the perfect control and noiselessness of its power, for its inspiring dignity of appearance, and for the studied attention to every smallest detail that provides complete comfort and relaxation, the White Berline stands unequalled.

THE WHITE  COMPANY  
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*Venus persuades Apollo to abandon his sun chariot for the White Berline.*



- Otto Cushing

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# THE AUTOMOBILE JOURNAL

VOL. XXXVI, No. 9

DECEMBER 10, 1913

Price, \$1.00 the Year

## PERFECTING BOSTON'S FIRE SYSTEM.

**Experimentation, Which Began Before the Great Fire of 1872, Now About to Be Culminated in the Expenditure of \$300,000 for Automobile Equipment.**

**F**ORTY-ONE years ago last month, the business section of Boston was practically wiped out by the most disastrous fire New England has known. Several conditions com-

bined to make possible such a general catastrophe. These conditions have very largely been overcome, but the officials of the Boston fire department are not entirely satisfied with the results attained, since Fire Commissioner Charles H. Cole has re-

quested an appropriation of \$300,000 for the purchase of motorized equipment during the next two years.

Nov. 9, 1872, when the big Boston fire began, the Boston fire department consisted of a chief, seven assistant chiefs and 185 men. The equipment comprised six steam fire engines, six hose

wagons and two hook and ladder trucks. Of course, the area of the city has been extended several times since that date, by annexation, etc. At present, the fighting force of the department consists of a chief, two deputy chiefs, 15 district chiefs and nearly 1000



**Chief John A. Mullen of the Boston Fire Department, in His Ross Steam Car, and Apparatus at Headquarters in Front of the Station on Bristol Street.**

men, including captains, lieutenants, engineers, etc. The equipment in active service at the beginning of the present fiscal year comprised 48

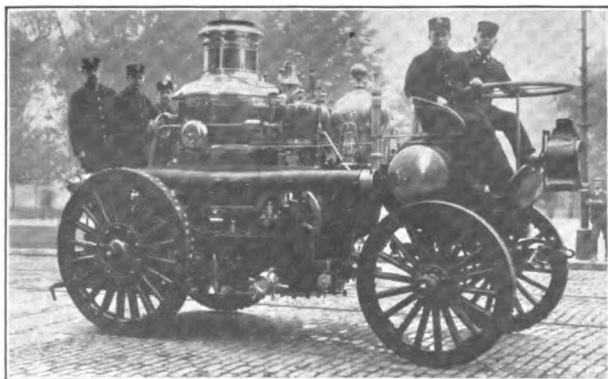




**Engine 38, Self-Propelled, Installed June, 1897.**

steam fire engines, including two fire boats; their tenders, 14 chemical engines, 31 hook and ladder trucks and four water towers. This number has been increased slightly during the year by purchase, but some pieces have been transferred to the reserve list.

For several weeks previous to the big fire the horses of the city had been suffering from an epizootic, and the department was seriously handicapped in consequence. A few days before the fire the department had received permission from the city council to impress any available horses in the city into service in case of need. However, there were no horses in Boston available for fire duty when the alarm was rung in, and the apparatus of the city was drawn to the scene of the conflagration by hand. Some historians state that oxen were utilized, but Chief John A. Mullen, who was a member of the state militia and served in that capacity during the fire, says this did not apply to the Boston fire department, as the men were able to haul the apparatus much faster than oxen. It may have been true of some outside companies, for 36 steam fire engines were rushed to Boston from surrounding cities and towns in New England,

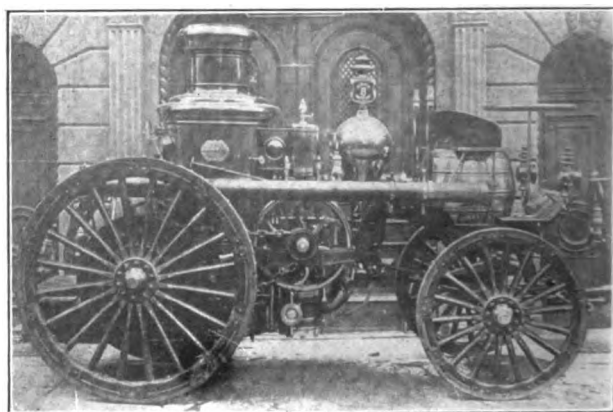


**Engine 35, Self-Propelled, Installed January, 1898.**

to aid the local department in fighting the flames.

The fire had gained some little headway before the first alarm was sounded, and the department was still further handicapped by the fact that the water mains in the district affected were fed by pipes of smaller dimensions and were themselves in poor condition. Many of the steam fire engines were forced to secure their water from hydrants at some little distance from the seat of the trouble, and the pressure was such that the supply in the mains was soon exhausted in many instances.

Five years before the big fire—Oct. 1, 1867, to be exact—Boston first turned its attention to self-propelled fire apparatus. At that time the Amoskeag people of Manchester, N. H., were experimenting with steam fire engines of this type, and it would appear that this experimentation was continued under an arrangement with the Boston fire department. One of the new engines



**Type of Self-Propelled Steam Pumping Engine Installed in Boston in 1872-3 and Later Converted for Horses.**

was brought to Boston and placed in the house of Engine Company 5 in East Boston. It was of the second class and its weight was 7000 pounds.

Perhaps it should be stated that the first steam fire engines were introduced in Boston in 1825, but their superiority over the old hand tubs was not recognized until 1858, for during that year six hand engines and two steamers were lined up on the Common in an exhaustive test. Two years later, in 1860, the entire department was placed on a horse drawn basis, in which steam fire engines predominated.

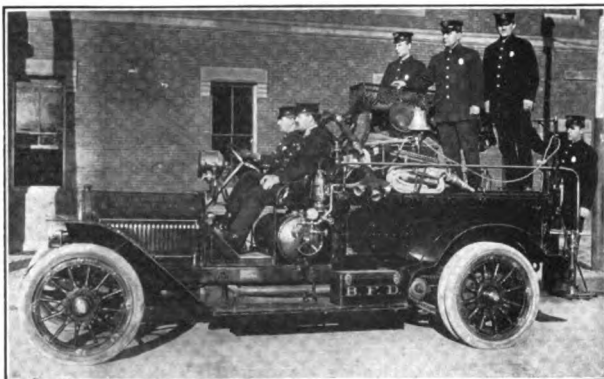
The arrival of the self-propeller in 1867 was an occasion of great importance, as may readily be supposed. Oct. 11 of that year it was placed on trial before the board of fire commissioners of New York City, the members of which came to Boston to see the innovation. At that trial it



developed a speed of three miles an hour, and later was able to traverse the crooked streets down town at a speed of four miles.

The propelling machinery consisted of a stout chain worked in slotted grooves and the links were fitted upon the main shaft and hub of the rear wheels, smaller chains being attached to the brake and connected with the forward axle. This information is available from a study of Brayley's "History of the Boston Fire Department".

From the same source, it is learned that during that same year an attempt was made to utilize liquid fuel, or what was known as a hydrocarbon, for steam engines, the invention of Col. H. R. Foot. This was applied to engine 3. To light the fire, a few shavings were placed under the retort, and when these were hot, the oil, which was carried in copper tanks placed over either spring at the rear of the engine, was let on, and vaporized as it issued from the burners. The



**Engine Tender 37, American-La France, Longwood Section.**

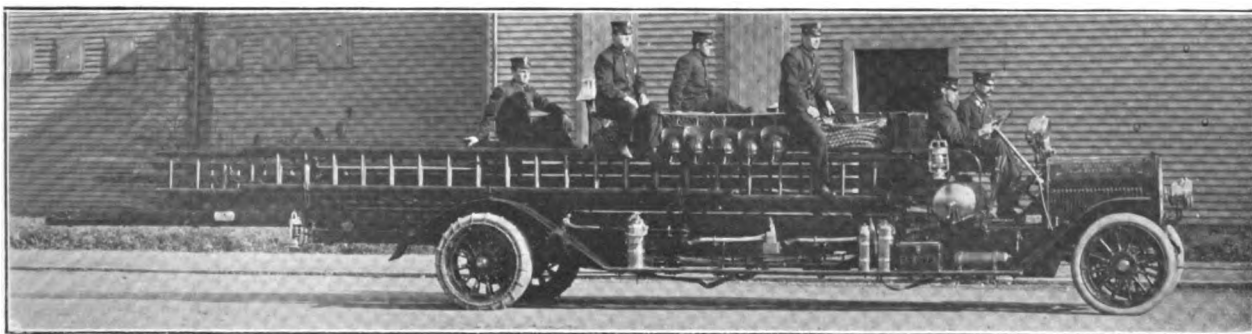
Engine 3, fitted with this invention, gave satisfactory results in a six hours' test, and in 1868 a committee was appointed to investigate Foot's claim that he could propel the apparatus to a fire without noise or smoke. This test proved a failure. The oil fuel was retained for a short time, but Nov. 7, 1868, it was abandoned as too dangerous, it having been found that the smoke stack became red hot under long exposure to the flame, and that no more steam pressure was secured than with coal.

It does not appear what became of the original self-propeller, but it is evident that it was not present in Boston during the big fire. Immediately after the fire, however, the department again turned its attention to self-propulsion. This machine also was made by the Amoskeag concern. It was installed with Engine Company 21 in Dorchester, very late in 1872 or early in 1873. At first this was considered a very satisfactory type, and the machine was in every respect similar to that delivered to the department in New York City in 1874. Hartford, Conn., purchased one of the Amoskeag self-propelled steam engines in 1876 and has had it in service ever since. The Boston engine remained in service a number of years, but it became unmanage-



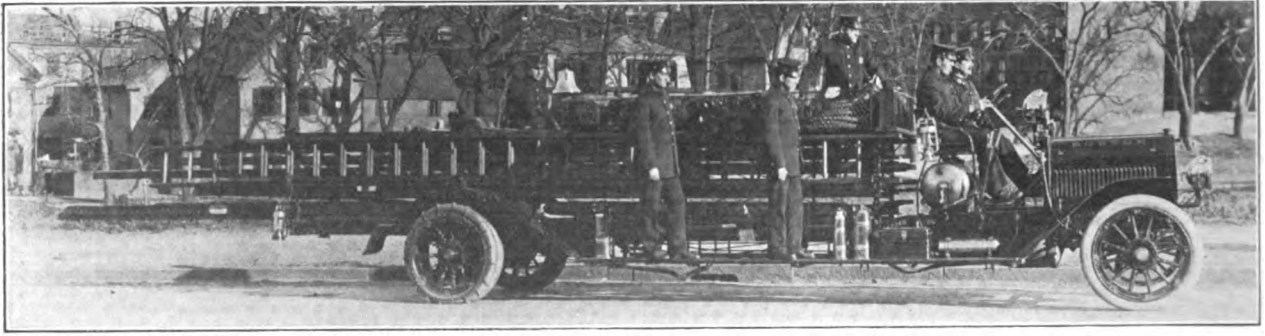
**Chemical 13, Knox Machine, at Forest Hills Station.**

pump added the necessary air and the normal condition of the fire was attained. The oil was conducted from the tank to the retort by a common gas pipe tube and its flow was regulated by a stop cock, enabling the engineer to gauge the intensity of the flame at his pleasure.



**American-La France Hook and Ladder Truck Installed at Oak Square Station, Brighton Section.**





**American-La France Hook and Ladder Truck in Service at Eggleston Square Station, Roxbury Section.**

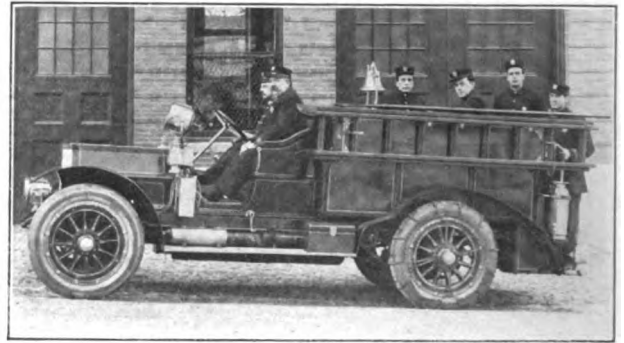
able on Beacon hill one day and rolled down the grade, injuring a citizen's foot. Subsequently the self-propelling chains were removed and it was converted into a horse drawn engine.

Boston has two self-propeller steam fire engines—engine 38, at the Congress street station, installed in June, 1897, and engine 35, at the Mason street station, installed in January, 1898. These are of the double extra, first class type, known as Jumbo, and have been utilized constantly until this year without rebuilding. They have only recently been fitted with rubber tires, which has increased their mobility some 50 per cent. in the opinion of Commissioner Cole and Chief Mullen. Both are of the Amoskeag make.

A knowledge of the automobile history of Boston at once raises the question as to why a larger percentage of the fire fighting apparatus is not motor equipped, for at present there are but four hook and ladder trucks, two combination chemical and hose wagons, one chemical engine and two tenders gasoline driven. One of these is a Knox machine and the others American-La France. To these vehicles should be added 24 Buick chief's wagons in service or ordered for immediate delivery, and four Velies. The answer is supplied by Chief Mullen.

He says that the absence of more automobile equipment is not due to a lack of apprecia-

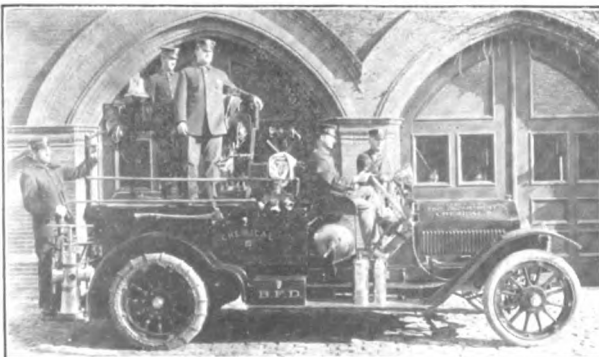
tion of the efficiency of such apparatus, but rather to the fact that the department had invested a large sum in steam fire engines prior to the time when the practicability of the automobile was fully established. The 48 steam fire engines now in service were purchased between 1870 and 1910. Boston is forced to depend very



**One of the Three Knox Wagons with the Boston Protective Association.**

largely upon pumping engines, and it will be conceded that the gasoline pumping engine was not regarded as practical by fire department officials in 1910. Many of the chemical engines, hook and ladder trucks and tenders also were purchased some years ago.

Chief Mullen has been giving the subject decided consideration during the past year, as is evidenced by his recommendations, which include: Nine gasoline pumping engines with capacity of not less than 700 gallons a minute, seven of which are to replace horse drawn steam engines; one tractor drawn steam engine; three tractors, to replace horses on three steam engines; 10 combination chemical and hose wagons, to replace horse drawn equipment of the same type; one high powered hose wagon; nine chemical engines, to replace horse drawn chemical engines; two 75 or 85-foot extension ladders, to replace horse drawn box trucks; 11 combination ladder trucks, to replace horse drawn trucks; two tractors for hook and ladder trucks, and three



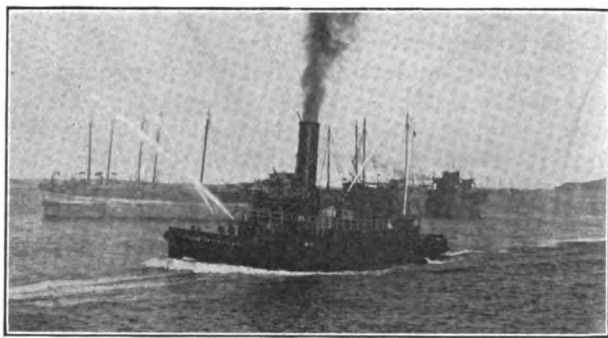
**Combination Chemical 5, Grove Hall Station, Dorchester.**



tractors, to replace horses on water towers. These recommendations are made by Chief Mullen in the interests of economy.

Fire Commissioner Cole goes one step further, adding a request that the \$15,000 appropriated for a new fire station at Parker Hill be transferred to the purchase of a motor ladder truck and a gasoline pumping engine to cover that section from other houses. This last recommendation, taken in connection with the approval of the chief's somewhat extensive list, is of particular interest, since Commissioner Cole reports that the experience of the Boston fire department does not bear out the figures made public from other cities, with respect to the comparative maintenance cost of the two types.

He asserts that a careful accounting shows that in large cities, where the apparatus is called upon to respond to alarms frequently, the cost of upkeep, including interest on the original in-

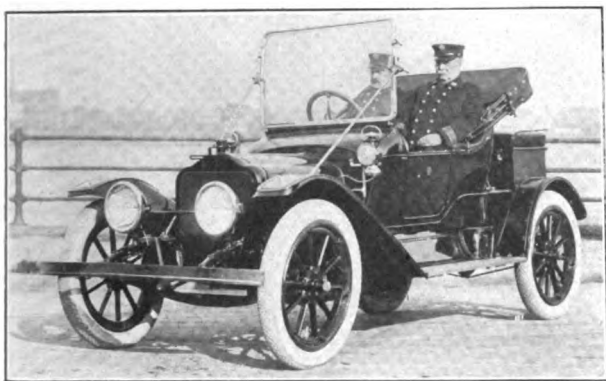


One of the Fire Boats with the Boston Fire Department.

Before deciding definitely in favor of gasoline chief's wagons, the department experimented for some years with Ross steam cars. Chief Mullen is shown in one of these machines in an accompanying illustration. Commissioner Cole explains that these have been abandoned, however, and that they should not be included in any listing of automobile equipment now in active service.

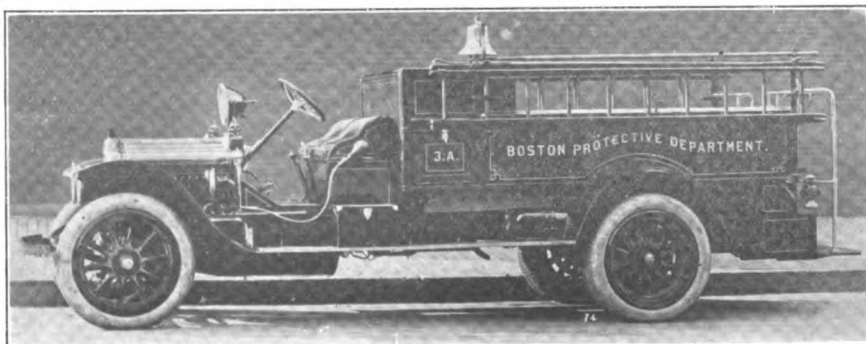
The Boston fire department maintains its own repair shop, in a special building close to the headquarters station on Bristol street. This is in charge of Eugene M. Byington as superintendent.

Superintendent Byington has seen long service in the department, dating from the days of the big fire, and is thoroughly familiar with every piece of apparatus. Under his direction many of the steam engines have been completely overhauled and rebuilt. When the automobile equipment first made its appearance he took advantage of every opportunity afforded to learn all about motor vehicles in a practical way. In view of the many factory branches in Boston and the large number of expert automobile workmen engaged in the service stations attached thereto, Superintendent Byington was enabled to secure the assistance of men who had had exceedingly practical experience in this work, and the repair



Superintendent Samuel Abbott, Boston Protective Association, and His White Roadster.

vestment, is greater with automobile equipment than the cost of a similar piece of horse drawn apparatus. He adds, however, that this does not take into consideration the matter of efficiency, or the fact that the department gains the services of the driver as an addition to the fire fighting force. From the above recommendation, it is apparent that Commissioner Cole also is mindful of the fact that the original investment may be reduced materially, when the cost of station and lot is added to that of equipment, for it is true in Boston, as elsewhere, that much less space is required for the housing of motor apparatus, than for equipment, horses, hay, etc.



White Wagon Installed with Company 2, Boston Protective Association.



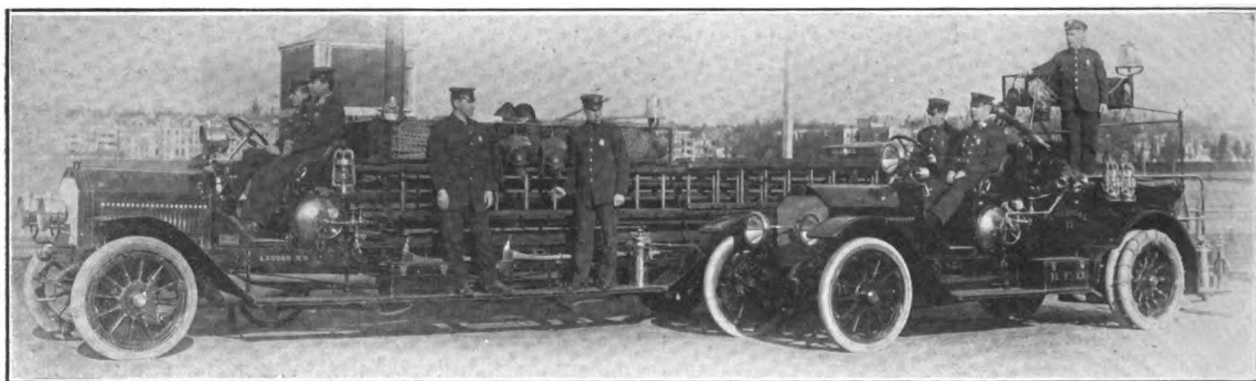
shop is well equipped to take care of its motor driven apparatus.

It will be understood that the foregoing applies solely to the Boston fire department. Other motor apparatus already is installed in towns and cities comprising metropolitan Boston, and the Boston Protective Association, which virtually is a part of the fire fighting force, soon will be completely motorized.

This association had its inception in 1849, when the insurance firm of Dobson & Jordan, 50 State street, procured two canvas bags, each filled with three small oilcloth covers, which were placed in charge of Assistant Engineer F. A. Coburn. Upon the sounding of a fire alarm, Coburn ran to the office of the company, impressed into service anyone whom he could secure, and covered goods likely to be damaged by water or smoke. In 1858, the insurance people made arrangements to have six covers carried in a box

the dark, what valves to close in order to prevent unnecessary use of the sprinklers and the resultant damage from water.

The association comprises three companies, stationed on Purchase, Appleton and Roxbury streets, under the command of Samuel Abbott as superintendent. Each company is supplied with two wagons, in which are carried the necessary covers, etc. One White wagon and a Knox are located in the Appleton street house, and two Knox machines at the house on Roxbury street. Superintendent Abbott has the use of a White roadster. At present there are two horses in the Purchase street station, but it is anticipated that these will be replaced by automobiles early next year. The association has utilized automobiles since Dec. 6, 1907, when a Knox air-cooled machine was installed, to be followed by another July 13, 1909. These were replaced by water-cooled Knox vehicles during the present year.



**Ladder 20 and Combination Chemical 11, Both American-La France Machines, Located at Lauriat Avenue Station, in the Dorchester District.**

on ladder 1, the members of the company to spread them over goods when not otherwise employed, each man to be paid 50 cents an hour for such work.

The first company was organized Oct. 1, 1868, and an old milk wagon was purchased in which to haul 25 covers, brooms and shovels. Sept. 1, 1870, a suitable vehicle was secured and steps were taken to incorporate the association. This was finally accomplished in 1874, and since that time, the Boston Protective Association has worked in conjunction with the Boston fire department. The insurance companies doing business in Boston pay an assessment in proportion to the amount of their premiums during each six months' period, and the association acts to protect property exposed to water in the fighting of fires. It also inspects the sprinkler systems and has devised a scheme of tags by means of which firemen are able to determine, even in

Any statement concerning the efforts of the Boston fire department to remedy the defects which were made apparent during the big fire would be incomplete without mention of the installation of what is known as the salt water system of protection in the business district. The entire section has been piped with large mains, in which a supply of salt water is available at all times. Special hose is utilized and provision is made for siamesing three, four or five of these so as to deliver a powerful stream six inches in diameter at the nozzle.

In case of fire in the business section the fire boats respond to the alarm, warping into place alongside one of the wharves on the water front. The powerful guns on these boats are attached to the salt water system mains and, with Boston harbor as a source of supply, sufficient pressure is maintained to throw a stream to the top of the highest building.



## AUSTRIA'S ELECTRIC POSTAL WAGONS.

**An Installation in Vienna Which Comprises 30 Electro-Daimler 2.5-Ton Vehicles  
—Garage Facilities, Battery Care and Construction of Machines.**

ONE of the most interesting installations of electric vehicles abroad is that recently inaugurated by the Austrian Postoffice Department in Vienna. This is particularly true, because, for reasons which do not appear exactly clear in this country, foreign business men have not looked with favor upon the use of electrics. The official indorsement of the Austrian imperial government is expected to mean much to this branch of the industry in Continental Europe, and very probably in Great Britain, as well.

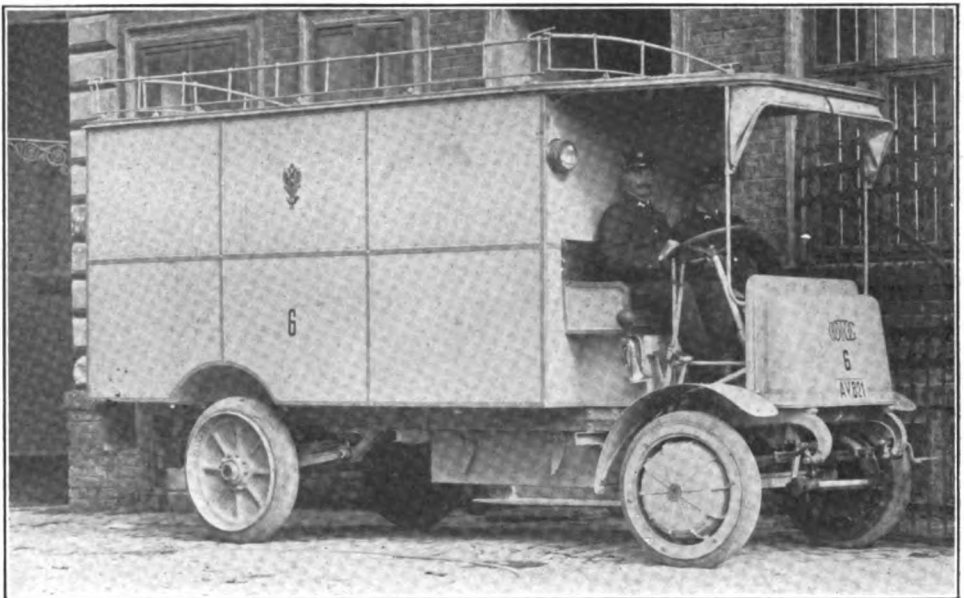
The installation comprises 30 Electro-Daimler wagons of practically 2.5 tons capacity, built by the Austrian Daimler Motoren-A. G., of Vienna, a concern which is much better known in America, at least, for its production of Austro-Daimler gasoline cars and trucks. The service was begun June 15 of this year, but not until experimentation covering a period of more than a year had demonstrated to the satisfaction of General Postmaster von Uhl that the electric was suitable in every respect.

It is not understood, as the result of correspondence with the maker of these cars, that they are owned by the government, inasmuch as the service is supplied by a private concern, the Austrian Daimler-Tudor Omnibus-Gesellschaft. This company has been operating electric omnibuses in Vienna for some two years, and it was from observation of these vehicles that the government officials first had their attention drawn to this type of transport.

Having decided to experiment with electrics, the imperial wagon works, Jacob Lohner & Co., Vienna, was commissioned to construct a special

body design to meet the needs of the postoffice department, in the transportation of packages and mails, and this was fitted to an Electro-Daimler chassis. This machine was delivered to the government March 1, 1912, and was at once placed under the charge of the omnibus company. During the year this was driven 17,000 kilometers (about 10,000 miles), and careful observation was made relative to its economy and efficiency. At the end of this experimental period the omnibus company made public the following:

General Postmaster von Uhl considered both types of vehicles, and found that the electric possessed the advantages of safety, cleanliness, simplicity, noiselessness



One of the Electro-Daimler Postal Wagons Utilized by the General Postmaster in the City of Vienna, Austria.

and of being odorless. It was also found that the cost for power was 20 per cent. less. The decision was made easily.

In Europe it has been felt that, on account of the disadvantages of the battery, electric power was not practicable for trucks, omnibuses, etc., while in America the use of specially heavy electric trucks has increased rapidly. With the constant advance in the price of gasoline, the electric will be used more and more, especially by such enterprises as this, where the installation is large. This year, this type of vehicle is gaining ground all over Europe, as is true in America. It is a mistaken idea that the battery gives trouble, as is borne out by a service of 15 months on a given line in Austria, covering 500,000 kilometers without interruption.

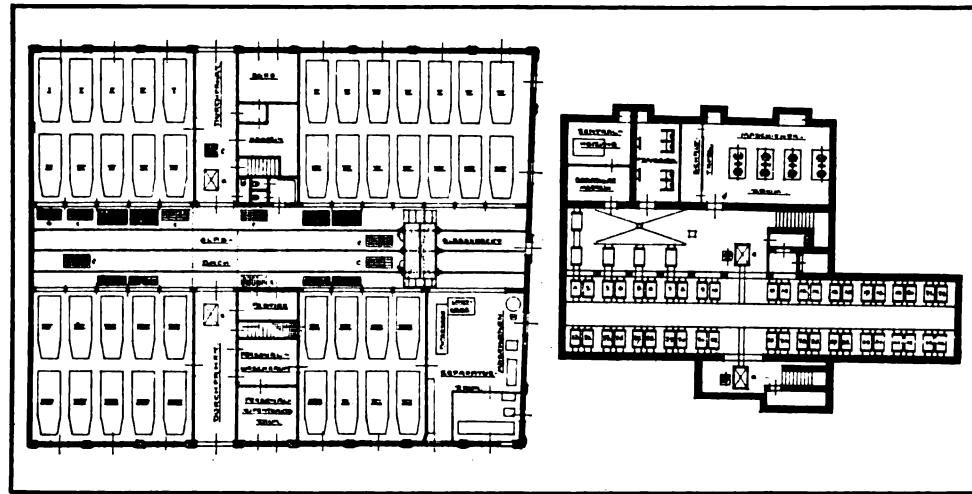
The postoffice machines in question are housed in a special garage, work on which was begun Oct. 29, 1912, and finished in May of this



year. The building is located with a frontage on three streets and is 40 by 31 meters (131 by 102 feet). It consists of one story and basement, the

ner, being supported by bars, as will be explained in more detail later, that a simple movement of these bars frees the crate and lowers it to the platform. The elevator then disappears into the basement and a fully charged battery is hoisted into place. The whole operation consumes between one and two minutes.

There were two good reasons for this arrangement of floor space, the first being that of segregating the battery work and providing for a quick exchange of batteries.



**Plan View of Postoffice Department's Garage in Vienna, Showing Arrangement of Stalls on the Main Floor at Left, and Location of Battery Room, Etc., in Basement at Right.**

cars being stored on the main floor, and the battery room being in the basement. The building was erected to accommodate 45 machines, although but 30 have been installed up to the present time.

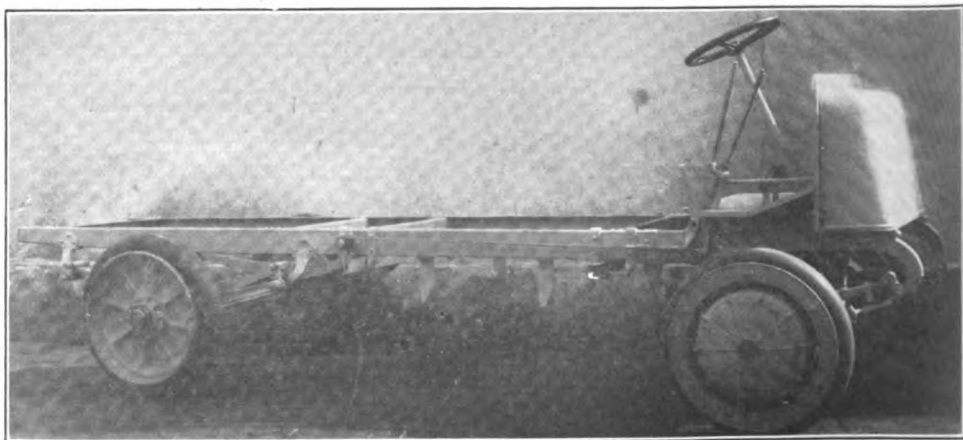
An accompanying diagram indicates the interior arrangement. It will be seen that the machines are assigned to stalls on either side of a main driveway through the building, and the government demands 10 square meters for each. Cars are not turned around in the garage under their own power, but are driven upon a turntable, which is mounted on rails so as to permit of its being used on any portion of the main driveway.

Whenever it becomes necessary to change a battery, the car is shunted into an aisle branching off at right angles to the main driveway, at either side, and is located over an opening into the basement. An elevator, bearing a platform, is hoisted through this opening until the top of the platform bears against the bottom of the chassis. The battery is carried on the chassis in such man-

ner, and the other, the necessity for economizing on space so as to provide for a power room, stock room, office and a large tool room and repair shop.

The power room is located in the basement. Current is delivered to the garage from the city electric works and at a voltage of 5000. This is transformed to 220 volts, alternating current. This is again transformed to 110 volts, direct current, for charging purposes, in a special room equipped with the very latest electrical appliances for this work.

The chassis, which are the product of the Austrian Daimler Motoren-A. G., are distinctive, in that the motors are located in the front wheels, a type of construction which is not entirely new



**Stripped Chassis of the Electro-Daimler Postal Wagon, Indicating the General Constructional Features.**



in American practise, however. The frame is of pressed alloy steel, and this is mounted on extra long springs designed to possess easy riding qualities. The axles are of chrome steel, and the rear wheels of pressed steel, mounted on ball bearings. There are two sets of brakes, in addition to the electric brake which operates on the front wheels, and both of these act direct on rear wheel drums. Tires are solid rubber, 850 by 140 mm front and 900 by 160 mm rear. The wheel-base is 3300 mm (130 inches).

The motors in the front wheels are with the pole pieces arranged in the form of a star, while the armature is attached to the case forming one side of the wheel, supported on either side by ball bearings, and the assembly is so bolted together as to provide practically a unit construction. The armature is wound in the conventional manner and the collector brushes are so positioned that the vertical vibrations of the car cannot injure them. The brush bridge is of the ring design, located on the forward part of the axle. The construction is such that by removing the outer safety casing or cover, the collector with its brushes is fully exposed and accessible. The motors are dust and water tight, and easily dismantled.

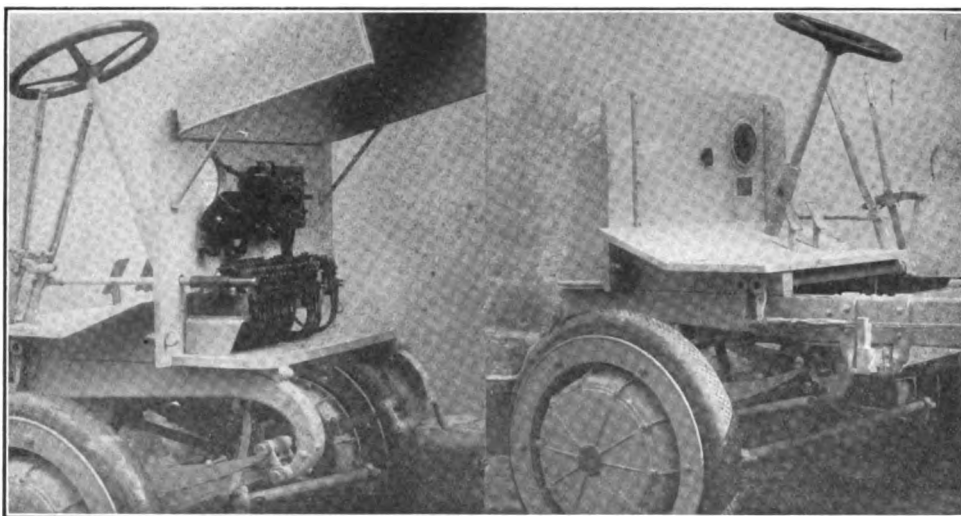
They are of the high speed type, 90-volt, with maximum of 15 horsepower.

The battery is carried in a tray in the centre of the chassis at the front, as indicated in an accompanying illustration. The method of fastening is extremely simple, two bars, or parallel rails, one at the front and the other at the rear, as shown, being inserted in clamps provided for that purpose. With the platform on the elevator pressing against the bottom of the tray, as explained above, the weight is taken from these bars and it is an easy matter to withdraw them, when the battery tray is immediately released from the chassis.

The batteries are each of 42 cells, type VI Ky 285/4, and are rated at 300 ampere-hours, with five hours discharge rate, and with maximum ca-

capacity of 60 amperes. Their weight is 870 kilogrammes (1918 pounds). In order that there shall be no opportunity for delay in the service, the company maintains 56 of these, so that it practically is possible to have one battery in reserve for each truck at all times.

All electrical apparatus—controller, switch, meters and coil—is carried at the front of the dash, where it is protected from dirt and dust by a short hood. This is readily accessible by lifting the cover, which is hinged at the top and provided with rods to hold it in an upright position. The controller gives three speeds forward and one in reverse, and operates the electric brake on the front wheels. The driver is at the right, with two levers also at the right. One of these actuates the emergency brake on the rear wheels and the other the controller, the latter



**Details of Electro-Daimler Construction: At Left, Location of Controller and Electrical Apparatus, Showing Worm Drive Employed; at Right, Front Wheel Casing Enclosing Electric Motor, Etc.**

working through a neat application of the worm and worm wheel principle. Steering is accomplished by a hand wheel of the conventional type.

The bodies are of special design, conforming to the specifications supplied by the postoffice officials, and are the product of the imperial wagon works, Jacob Lohner & Co. They are entirely enclosed, with entrance from the rear, and may be locked so that the driver and attendant may not reach the contents. Inside is a special compartment for valuable packages, this box being lined with zinc. Provision is made on top for carrying extra large packages, a wire fence preventing dislodgement. This fence is made so that it may be turned down, on account of the entrances to several of the postal stations, the machines being driven directly into the buildings



and the contents being handled by government officials alone.

As the service is furnished by a private corporation, each vehicle is fitted with a speedometer, payment being made for each kilometer travelled. The wagons have a guaranteed radius of 35 kilometers (21.7 miles). The tires also are supplied on a guaranteed service basis.

### OAKLAND WINS ABROAD.

#### Cablegram from Buenos Aires Announces Victory for American Car.

A cablegram received last week from Buenos Aires, Argentina, announced that: "In Rosario, Argentina, race just finished, Oakland model 45, stock car, came in first, class C". No further details of the event are at hand, and it will be approximately 30 days before mails from Buenos Aires will be received in New York City.

The Oakland Motor Car Company, Pontiac, Mich., maker of the car, states that this machine was a regular 1913 stock export machine, and its performance cannot be compared with any of the races in this country. Such events in South America are invariably held over roads which are not prepared in any way. Drivers are called upon to exercise great skill because of the fact that many of these highways frequently cross open streams, etc. The Oakland has been entered in a number of these Argentina races and has always made an excellent showing.

### WILSON BECOMES PRESIDENT.

#### Pennsylvania Man Selected as Head of American Automobile Association.

John A. Wilson, of the Pennsylvania Motor Federation, was elected president of the American Automobile Association at its annual meeting in Richmond, Va., Dec. 3. Enos Laurens, Buffalo, N. Y., the retiring president, declined to stand for re-election. The other officers are: First vice president, Dr. H. M. Howe, Automobile Club of Maryland; second vice president, R. W. Smith, Colorado; third vice president, F. L. Baker, California; fourth vice president, H. J. Clark, Minnesota; fifth vice president, Preston Belvin, Virginia; secretary, John N. Brooks, Connecticut; treasurer, H. A. Bonnell, New Jersey; chairman of the executive board, A. G. Batchelder, New York City. President Wilson appointed the following committee chairmen: Good roads, George C. Diehl, New York; legisla-

tive, C. C. James, Ohio; touring, Howard Longstreth, Pennsylvania; contests, William Schimpf, New York.

The association gave emphatic indorsement to the Adamson measure in Congress, providing that after an automobile owner has registered his car in one state he shall be privileged to go anywhere in the United States without further registration. The secretary of the interior was complimented for his favorable action in admitting automobiles to national parks.

Perhaps the most important action of all was the passage of a resolution placing the association on record as opposing a registration tax unless it shall be in lieu of all other taxes, and the money thus raised to be expended in connection with roads maintenance. The so-called New Jersey test case has been taken to the United States supreme court and will be pressed with all due speed to an ultimate determination as to the constitutionality of existing registration laws of this character.

The next annual meeting will be held in Boston.

### INCREASES CAPITAL STOCK.

#### Hupp Motor Car Company Adds Another \$250,000 by Stock Dividend.

The officials of the Hupp Motor Car Company, Detroit, have filed papers with the secretary of state increasing the capital stock of the company from \$750,000 to \$1,000,000, the increase being made by a 33.3 per cent. stock dividend taken out of the surplus.

This action was taken to provide for extension of factory equipment and the expansion of the organization made necessary by the preparations for the coming season. Plans are now under way for the erection of additional buildings to take care of the increased production.

This stock dividend just issued makes the sixth increase in capital since the incorporation of the company. In November, 1908, the capital was \$25,000; in December, 1908, it was increased to \$50,000; in March, 1910, to \$250,000; in June, 1911, to \$500,000; in September, 1912, to \$750,000.

It is anticipated that many motorists will be interested in the safety and sanitary conference to be held in Rumford hall, Chemists' building, 50 East 41st street, New York City, Dec. 10-12. Several matters affecting the safety of the public under the present day changed traffic conditions will be considered by speakers of prominence who have specialized along these lines.



**JENATZY KILLED BY FRIEND.**

**Accidentally Shot While on Hunting Party, Being Mistaken for a Deer.**

Camille Jenatzy, the Belgian automobile racing pilot, was accidentally killed Dec. 8 by the editor of a Brussels newspaper during a hunting trip. Jenatzy was mistaken in the twilight for a deer and received an explosive bullet in his thigh. He soon died from the wound.

**J. H. S. SHOCK ABSORBERS.**

**The Sager Company Makes a Special Offer to Ford Owners.**

The J. H. Sager Company, Rochester, N. Y., maker of Sager equalizers, bumpers, etc., is marketing a new type of shock absorbers which includes a design for model T Ford automobiles. They involve mechanical principles and are similar in construction to the hydrocarbon motor in that a cylinder and piston are employed in conjunction with a coiled spring. The piston acts in harmony with the spring and the latter is so proportioned and fitted that all shocks, vibrations, etc., are eliminated and absorbed. One of the qualities of the J. H. S. is that as easy riding features are provided with the car empty as loaded. The application to the Ford cars is very simple and neat, as will be noted by accompanying illustrations, which show the absorber attached to the front and rear springs on a Ford machine. The J. H. Sager Company is making a special free trial offer, which provides for a return of the absorbers after 30 days' use if not satisfactory. The company also guarantees to replace any broken part within a year after purchase.

**CONSOLIDATION NOT EFFECTED.**

**Merger Fails Because Location Cannot Be Agreed on by Stockholders.**

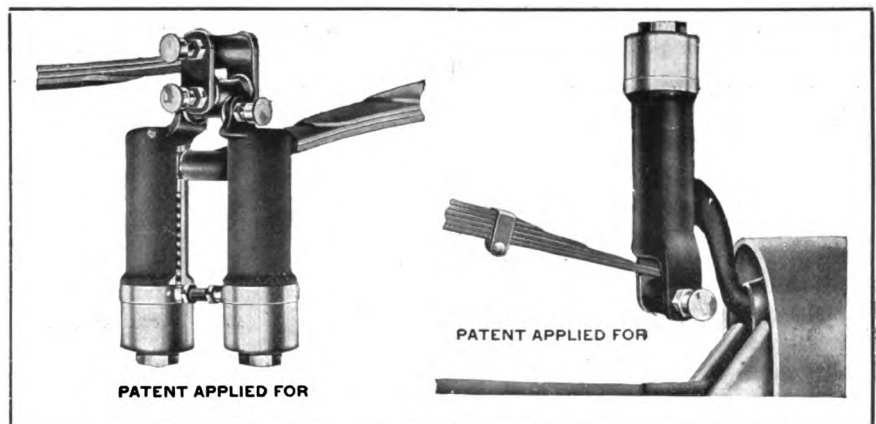
The proposed merger of the Minneapolis Motor Company, Minneapolis, Minn., maker of motorcycles, and the Colby Motor Company, Mason City, Ia., maker of Colby cars, has fallen through.

The Standard Motor Company, Minneapolis, Minn., was formed for the purpose of taking over these companies and was incorporated under the laws of Delaware with a capital stock of \$6,000,000. The men identified with the new company went so far as to elect officers, but it is reported a controversy followed as to whether the company would locate in Minneapolis or Mason City, and as no agreement could be reached the stockholders decided to continue individually.

**KEYSTONE IS BUZBY'S PROPERTY.**

**Chicago Concern Ordered to Discontinue the Use of the Word in Corporate Name.**

Through a decision of the United States district court the word Keystone, as applied to greases and lubricating oils, is the property of Augustus C. Buzby, doing business as the Key-



**J. H. S. Shock Absorber Attached to Front and Rear Springs on Ford Car.**

stone Lubricating Company, because of his introduction of his product under that name in 1885. The suit in which the validity of this trade mark was established was between the Keystone Lubricating Company, Philadelphia, Penn., and the Keystone Oil & Manufacturing Company, Chicago, Ill., on complaint of former that the Chicago company had incorporated in 1900 under the name Keystone with the purpose of obtaining advantage through use of name of an established product, and the court decided that this claim was well founded, despite the fact that that product of the Chicago company was not marked with the trade mark nor sold as Keystone grease. The court ordered that the Chicago concern should incorporate its lubricating grease business under another name or adopt a plan that would not be an infringement of the Philadelphia company's rights.



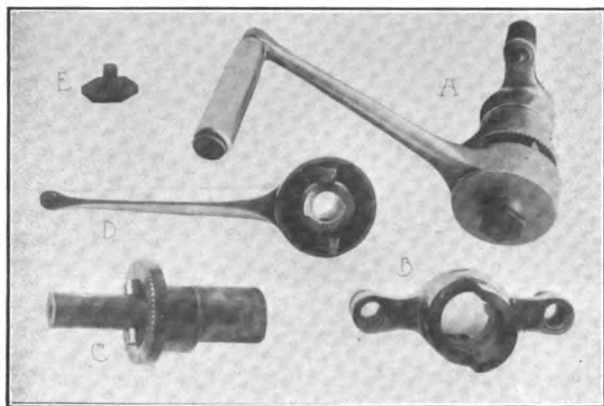
tires on the rear. Quick detachable, quick demountable rims are standard equipment. With the exception of the raceabout, a pressure system of fuel feed is employed, a gear driven pump being utilized. The tank of the raceabout is located directly back of the seats, forming a part of the rear deck, and has a capacity of 25 gallons, and has a compartment that will carry five gallons of oil.

A 120 ampere-hour storage battery is included in the lighting and motor starting systems. The motor starter is located on a sub-frame and its energy is applied by a pinion meshing with a gear cut in the flywheel of the engine. The switch is located on the dash control board.

### CLARK SAFETY ENGINE STARTER.

**Designed to Replace Usual Crank and to Prevent Accidents Caused by Back Firing.**

W. R. Clark, Muncie, Ind., has invented and patented a safety starting crank for motor cars



**Clark Safety Engine Starter: A, Starter Assembled; B, Bracket Retaining Clutch Breaker; C, in Rigid Position; D, Handle or Clutch Proper; E, Hexagon Nut Securing Handle and Clutch Breaker.**

which is stated to be so designed that it cannot be turned anti-clockwise in the event of the motor being cranked with the spark advanced. The construction is simple, and one of the qualities of the invention is that it may be permanently attached to the car or instantly removed, making it adaptable to vehicles equipped with motor starters.

The Clark engine starter comprises three parts and a hexagon nut, the latter being utilized to secure the handle and the clutch breaker, as the safety device is termed by the inventor. The components of the device are shown in an accompanying illustration, that at A showing the parts assembled.

The bracket B is attached to the cross frame member, or usual support below the radiator, and serves to rigidly retain the clutch breaker C. It also provides a positive support for the handle proper. This bracket is made in various styles to fit all makes of vehicles.

The clutch breaker is of steel and manganese bronze squared to .625 inch, but can be increased up to and including 1.25 inches as the installation may require, and to engage with the motor crankshaft or the conventional starting handle. It is fitted by cutting off the old handle and squaring the shaft to fit the clutch breaker, which is supplied with all necessary adjustments so that it can be used with spring attachments provided for keeping the crank disengaged when the motor is operating. The roller members are of the anti-friction type and the ratchet is of manganese bronze. The handle D, the clutch proper, is of steel, and the maker states that the pawls are practically indestructible, as they mesh with the ratchet only in the event of a back fire.

The Clark safety starter is used by pressing in the handle D in the usual manner, which engages the shaft of the clutch breaker C. Rotating the handle to the right imparts movement to the crankshaft of the engine, but in the event of a reverse movement, such as follows back firing, two pawls engage the ratchet of the clutch breaker, throwing out the crank and breaking connection between it and the shaft. It will be noted that the teeth of the ratchet are so cut that the pawls will mesh only when a reverse movement of the shaft takes place.

Four different finishes are supplied, nickel, brass, oxydized and japan. The Clark safety device is moderately priced and the Clark Crank Company of Muncie, Ind., has been organized to market it.

### BUYS LONG HORN.

**H. W. Johns-Manville Company Takes Over Business of Piel Concern.**

All the manufacturing and selling rights and stock on hand of the Long horn, made by the G. Piel Company, Long Island City, have been purchased by the H. W. Johns-Manville Company, New York City.

The new owner will immediately send a supply of the horns to the different branches and dealers handling this product, and no interruption in the conducting of the business is expected.



## LARGE CARS VS. SMALL CARS.

**I**NTEREST in the cyclecar situation is such that discussions respecting the merits of the new type of machine are particularly timely. The communication presented below takes up the matter from the viewpoint of the cyclecar manufacturer. The opinions are those of Harry J. Stoops, vice president and general manager of the American Cyclecar Company, Bridgeport, Conn., maker of the Trumbull machine.

The fundamental principles of motor car manufacture and motor car selling are the same principles which underlie the great variety of business undertakings everywhere today. These principles may all be summed up and expressed in the idea of "the greatest good to the greatest number". Modern tendencies and business methods generally have this idea as the ultimate end to be reached, and conditions are molded, plans are laid and processes evolved to reach this goal successfully. With this idea in mind, a comparison of large motor cars with small ones, in the cost of manufacture and profit resulting from their sales, is of interest.

### Proportioning the Overhead.

The large car is manufactured on a limited scale and consequently its margin over and above its actual cost must be greater than the small car. The overhead cost of manufacture of a small quantity of large cars is greater proportionally than for small cars, and the necessary expense attached to the selling of them is equally so. This overhead for the small car is divided over a greater output and it stands to reason that a car which sells readily because its price enables a larger class of buyers to purchase, reduces the actual expense of its sale.

Then, too, as the manufacture of the large car is limited in number so is the class of people limited, who can afford to buy and operate it. The small car is produced in quantity because the demand—arising from a larger class of people who can afford it—is greater.

This idea of quantity production resulting in a car to be sold at a low price, small profit, and in large numbers to many purchasers, has its counterpart in familiar institutions of every day life. The department store, five and 10-cent stores and nickel "movies" are good examples. In the large department stores the profit per sale is very small, but the number of sales shows an enormous balance to profits in the end. Do you suppose for a moment that the Woolworth building (one of the modern architectural wonders) would have been dedicated with that name if the parent business and management had catered only to the few—carried charge accounts—instead of considering that class of people with the cash in hand, small though the sum may be, which made the millions of purchases? If the operation of our railways and street cars was such that the common people could not patronize them, what would be the value of their millions of stock?

### A Class to Be Considered.

The intermediate class must be considered, and their desires and wants catered to, if big business is to succeed. How many people do you know who started out to handle fancy goods of any kind, at fancy prices, that have succeeded? Only a few. There have been many failures. On the other hand, scores have succeeded where their goods were necessities, or even luxuries, if within reach of the numbers.

The fundamental idea which made big business in the past in other lines, is just as true today in the automobile industry. The few far sighted men, who have furnished cars within reach of the comfortable middle class, have made millions of dollars for themselves and have made thousands of people happy.

Too long the tendency has been to consider the class who purchase big cars; to consider only big profits; big fellows; to the almost exclusion of the intermediate class, whose human desires are the same as the so-called "big fellow"—those who have a few hundred dollars tucked away, but who cannot afford to speculate on the purchase of a big car. The people of this class would

enjoy the holiday in the country, or going to or from their homes to business quickly and comfortably, as much as their more fortunate brothers.

### Quick Sales, Small Profits.

There is one way to reach all these people—small cars at small profit, many quick sales at small expense—and it's a cash sale in a much larger percentage of cases than the larger car.

Think of the actual selling conditions of a small inexpensive car. You have made the sale quickly, your customer is satisfied, he owns something, and better yet, owes nothing, a pleasing transaction and you are elated that you have been instrumental in making another friend by selling him something he can afford to buy, to keep and operate without placing a mortgage on the home, and perhaps a second one, because of excessive operating and upkeep expense. You are making 10 friends, where you formerly took the chance of making one—10 small quick sales, 10 small quick profits. How long before you are a big man with a big business? Just one-tenth as long as had you followed big profits, big sales and big cars exclusively.

Your sales will not be confined to those who can afford only a low priced car on account of circumstances. The so-called "big fellow" would not be driving the big car if he had not used good judgment in business. If he is a man of a family (most of them are) and cannot house and keep a fleet of large cars, he will consider a small, light, neat, comfortable car as a tender to the big one. He can store two or three of these cars on the same floor that would be taken by a large one. These small cars can be used for most every purpose. When mother has use for the family machine, father goes to work in the small one. His sons and daughters use the small cars to get to their clubs, parties, or picnic and without a chauffeur, but with a friend. All are taken care of, and all are happy—thanks to the small car.

### Possibilities with the Cyclecar.

Get in touch immediately with the manufacturer of the cyclecar, miniature automobile, or light car, to fill the gap which has existed for years—that intermediate field between the automobile and the motorcycle. This car you can sell your friends who told you, last season and this, that they could not afford an automobile and that the motorcycle did not meet their requirements. This is the car that will take you anywhere the "big fellow" can go (and some places he cannot); a car in keeping with the income, with upkeep and operation reduced to a minimum. Anyone with such a car feels equally as secure with a \$10 bill in his pocket, and is as amply protected as the "big fellow" with the big car and 10 times \$10.

You will have more prestige, more business, more friends and more money if your place is known as the house of the small car, small profits, many sales, than to continue lending your strength in support of large cars, few sales and profits which in the end amount to less than the profit from many small sales.

The cyclecar, or miniature automobile, comes nearest in its field to the fundamental idea of all big business—"the greatest good to the greatest number".

Announcement is made by those in charge of the Importers' Salon to be held in the Hotel Astor, New York City, Jan. 2-10, that many of the attractive foreign body designs seen at the recent Paris Salon and the Olympia show in London, will be displayed here next month. Chief among these is the new boat type, and several different interpretations of this will be presented.

Seattle, Wash., has plans under way for the construction of a \$200,000 two-mile wood saucer track, on which it is expected a \$25,000 prize meet will be held early in 1914.



## U. S. ROAD OFFICE ADVISES "RAISE TRUCK TAX."

**T**HE power wagon industry, the owners of motor wagons and trucks, and practically every business man in the nation, will be interested in the attitude of the United States government as demonstrated by the report of Logan Waller Page, head of the office of public roads of the Department of Agriculture, made to Governor Pothier of Rhode Island, which, among other things, advocates the increase of present taxes, or a direct taxation of service vehicles for the maintenance of state highways.

This is one of the most radical recommendations ever issued by a United States official, and it seemingly has the approval of the Department of Agriculture, for it proposes that motor trucks be specially taxed to secure funds to keep in repair the roads included in the state system. This proposition has been taken up by the Rhode Island Motor Truck Owners' Association and that organization is now fortifying itself to oppose such legislation as may be proposed at the coming session of the General Assembly in January.

The state board of public roads was the object of an attack by a Providence newspaper that sought to defeat a proposal to issue state bonds to provide funds to meet appropriations made for the construction of new highways. This was inaugurated two days before the election and the bond issue was not approved. Later on, possibly by invitation of Governor Pothier, although the authority is not stated, an engineer attached to the office of public roads made a tour of the roads of the state system, examined the records of the office, and data secured are the basis of a report that suggests the abolition of the present state board of public roads, recommends the substitution of a single-headed commission, criticizes the general conditions of administration as "very loose", declares the records are not accurately kept, states that the specifications are inadequate, maintains that quality of materials is not tested, scores the system of payment, comments on expensive errors of judgment, proposes that the manner of designating roads to be built or repaired be changed, advocates the increase of registration tax on motor trucks and advises the building of state roads by convict labor.

This is the first time in the history of state highway system administration that the federal government has undertaken to direct or advise. There is no precedent for this, any more than for supervision of the state courts or any other

department of state government. Why the federal government was invited to undertake this "investigation" does not appear, and apparently the supposition is that the people of the state are incapable of governing themselves. Governor Pothier has apparently assumed that this is desirable. Primarily the inquiry appears to be the result of attack on the members of the state board of public roads, who have held office continuously for 12 years.

The fact remains that there are state and federal constitutions to be considered. Motor trucks are taxed in Rhode Island as personal property at a rate of \$16.50 for each \$1000 valuation, and any increase of registration tax (\$2 a vehicle is now paid) would be a second tax, which is unconstitutional under a number of state decisions. There are now about 12,000 pleasure cars and 1800 motor wagons and trucks registered in the state. An increase would affect residents of other states who have occasion to do business in Rhode Island, especially those of Massachusetts and Connecticut.

Aside from the unconstitutional aspect, a majority of the owners of machines maintain that if they are required to pay an increased registration tax they will discontinue the use of motor vehicles.

The most threatening fact is that if the federal government has the right to dictate what shall be a registration tax for power wagons in Rhode Island, it certainly can exercise the same supervision in every other state, and direct and influence the tax, or a part of the tax, that shall be paid by individuals to the state.

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### B. T. KINSMAN DEAD.

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**Manager of Studebaker Chicago Branch Succumbs to Acute Indigestion.**

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B. T. Kinsman, manager of the Chicago branch of the Studebaker Corporation, Detroit, and formerly connected in a similar capacity with the Boston and Buffalo branches, died suddenly in Buffalo from acute indigestion. Mr. Kinsman was known to a wide circle of friends in the automobile industry.

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The Studebaker Corporation of South Bend, Ind., and Detroit, has presented the engineering department of the University of Michigan a stripped Studebaker chassis.



## GENERAL NEWS OF THE INDUSTRY.

### Notable Increase in Working Forces of Four Detroit Concerns—United States Court Upholds Canfield Patent, Owned by A. R. Mosler & Co.

**A**N INTERESTING commentary on present business conditions, with special reference to the automobile industry, is found in the fact that at least four of the big Detroit concerns have greatly increased their working forces over those for November, 1912. The comparison for the two years follows:

|                  | 1912 | 1913   |
|------------------|------|--------|
| Ford .....       | 8000 | 12,000 |
| Cadillac .....   | 6200 | 7,070  |
| Studebaker ..... | 4800 | 7,000  |
| Chalmers .....   | 3600 | 4,000  |

This should by no means be taken as a total list of the concerns in the heart of the industry which have found it necessary to increase their factory facilities in this respect. It so happens that these are the only figures which have been made public in this connection, but it is known that several other companies have found it necessary to follow the same plan.

#### CANFIELD PATENT IS VALID.

#### A. R. Mosler & Co. Obtains Injunction Prohibiting Sale of Infringements.

A decision by the United States district court of appeals in New York City, made by Judge Lacombe and concurred in by Judge Ward and Judge Rogers, in the suit of A. R. Mosler & Co., against John Lurie, maintains that the Canfield patent, owned by the complainant, is valid and the defendant is enjoined from selling the six different makes of spark plugs named in the bill of complaint. The attorney for the complainant, W. A. Redding, claims that the decision is very broad and that it will affect practically every maker of spark plugs.

The Canfield patent is the invention of Frank W. Canfield, engaged in lumber trade at Manistee, Mich., the papers establishing it being issued Oct. 18, 1898. He died the following year. The patent was acquired by the Associated Patents Company, which organization was affiliated with the Association of Licensed Automobile Manufacturers. The association licensed each member to use the plug and then sold the patent to A. R. Mosler & Co.

Lurie was proprietor of the Automobile Supply Company, New York City. The suit for in-

fringement was begun in 1909 and it was dismissed in the United States circuit court by Judge Mayer. An appeal was taken and this has now been decided. The principal claim is for a recess in a spark plug surrounding the central electrode to prevent the accumulation of soot or carbon, this recess being necessary to insure a full spark and prevent a short circuit.

A. R. Mosler, president of A. R. Mosler & Co., states that the policy of his company will be broad and unselfish, but the co-operation of every legitimate spark plug manufacturer is expected. On the other hand, the rights of the company under the recent decision will be vigorously protected. The licensees under the Canfield patent now include A. R. Mosler & Co., Auburn Ignition Company, Benford Manufacturing Company,



Two Prominent Haynes Officials: At Left, L. R. McKensie, Assistant Sales Manager; at Right, T. L. Tinscher, Special Representative.

Champion Ignition Company, Champion Spark Plug Company, Frontier Specialty Company, Hartford Machine Screw Company, Jeffery-De-witt Company, C. A. Mezger, Inc., Rajah Auto Supply Company and the Silvēx Company.

#### NEW HAYNES MANAGERS.

#### Something Concerning the Men Who Help Make Success for Kokomo Product.

The Haynes Automobile Company, Kokomo, Ind., maker of the Haynes line of pleasure cars, is enjoying a particularly successful year, and it is of interest to consider personally some of the



men who have helped. An accompanying illustration presents L. R. McKenzie, assistant sales manager, and T. L. Tincher, special field representative.

Mr. McKenzie is thoroughly acquainted with all the mechanical details of an automobile, and can drive, sell, demonstrate or repair a machine, as well as handle with equal efficiency both men and correspondence. He formerly was connected with the Studebaker Corporation of Detroit and South Bend, Ind.

Mr. Tincher is considered the dean among Haynes men on the firing line, so to speak. Like Mr. McKenzie, he is thoroughly conversant with every phase of the automobile business, but excels chiefly in his ability as a salesman. Before his connection with the Haynes company he was engaged in the manufacture of Tincher cars in

one of any other make of electric. During the past the electric car manufacturers had secured space at these shows only after the association members who manufactured gasoline cars had been assigned space. Today the electric vehicle builders are placed on the same plane as are the gasoline automobile makers, an evidence of the greatly increased demand for electrics.

### IN NEW HEADQUARTERS.

**Executive Offices of Empire Automobile Company Occupy Handsome Building.**

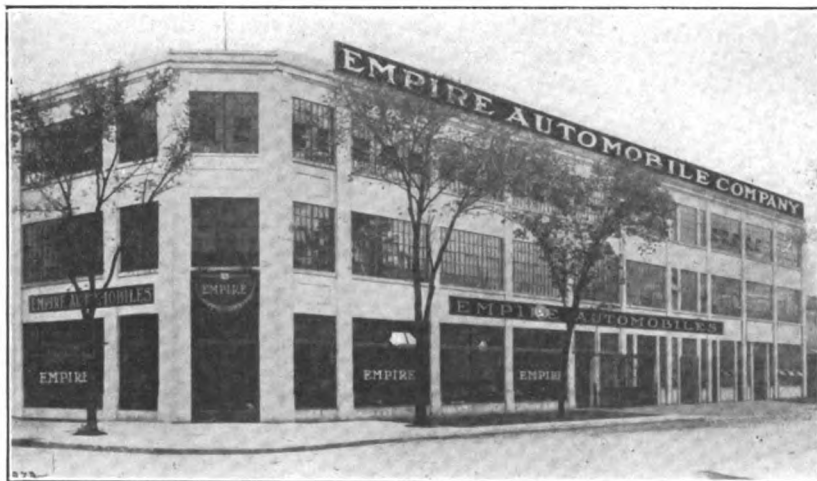
For a long time the executive offices of the Empire Automobile Company, Indianapolis, Ind., maker of the Empire Little Aristocrat, have been inadequate, and it is with some little satisfaction

that it is announced that the new headquarters at Capitol avenue and Michigan street are ready for occupancy. The structure is shown in an accompanying illustration, and is located in the heart of Indianapolis' motor colony.

The building is of concrete and steel, three stories high, and equipped in the most modern manner. There are 25,000 square feet of floor space, and the ceilings are high, assuring light and airy offices and workrooms. In it are housed the executive and general offices, the central supply station of the service bureau and the large

parts stock room. On the first floor are the offices of the sales, advertising, service and accounting and purchasing departments, also the general sales showrooms. The offices of General Manager Cecil E. Gibson, Chief Engineer Louis Schwitzer and the latter's engineering staff are located on the second floor.

The service and parts stock rooms occupy the remainder of the space, and these are arranged along modern lines that insure speed and accuracy in filling parts orders, and in rushing them to trains and transportation companies. Incidentally, the central location of Indianapolis, both in relation to the population of the country and to quick rail communication with all parts, are features which make for speed Empire service. The Empire plant at Connersville, Ind., is also conveniently situated.



**New Headquarters and Executive Offices of the Empire Automobile Company in Indianapolis, Ind.**

Chicago, and became well and favorably known to the trade.

### ANDERSON HAS FIRST CHOICE.

**Detroit Concern Given Precedence in Show Space Allotment on Business Done.**

By the conditions of the new plan of the National Automobile Chamber of Commerce for allotting space at the annual New York and Chicago automobile shows, the Anderson Electric Car Company, Detroit, has been given first choice of the electric vehicle manufacturers.

The first allotment in the automobile divisions is now made to the manufacturer with the largest annual business to his credit, and in the order of production. During the 1913 season approximately two Detroit electrics were sold to



**BUYS HARROUN CARBURETOR.****Pennsylvania Oil Interests Acquire Plant and Business in Indianapolis.**

The Harroun Company, Indianapolis, Ind., maker of kerosene carburetors, has been absorbed by the Electric Renovator Manufacturing Company, Pittsburg, Penn. The Pittsburg company is said to be controlled by a group of the largest independent oil operators in America, and the fact it has taken over the Harroun interests is held to be an indication that the future necessity for a kerosene carburetor is appreciated by those who are in a position to know the actual fuel conditions.

The factory will remain in Indianapolis, at least for the present, and will be operated in conjunction with the Pittsburg plant. Ray Harroun, who has developed the carburetor from its inception to its present form, will remain with the new interests as an officer of the company, and will concentrate his efforts in development and exploitation work toward broadening the field for the product.

**WILL REDUCE PRICES.****KisselKar Maker to Set a New Low Record for Six-Cylinder Machines.**

Following the annual inventory and plant renovations of the Kissel Motor Car Company, Hartford, Wis., during which both the Hartford and Milwaukee factories were closed, interesting manufacturing plans are being discussed. It is expected that early in January announcement will be made of two entirely new KisselKar models, one of which will be a four-cylinder machine and the other a six.

The prices on both are to be reduced, according to the information disclosed, and the latter will set a new low price record for sixes, selling for considerably less than \$2000. Details of the two new models are not yet ready for publication, but it is stated that there will be no sacrifice in quality, either of workmanship or material.

**GASOLINE-ELECTRIC TRUCK.****New Concern Organized in New York City to Produce a New Design.**

The Roland Gas-Electric Vehicle Company has been formed in New York City with a capital stock of \$200,000 by Perch K. Hexter, Roland

R. Conklin and Stanley L. Conklin as incorporators. It will produce a gasoline-electric truck which has been developed by Mr. Hexter.

The vehicle weighs about 8000 pounds and is rated at four tons capacity. The company has secured factory accommodations at Avenue B and 20th street and expects to start with an initial output of 100 trucks.

**KINCAID GOES WEST.****Well Known Oil Man Now Special Representative of National Refining Company.**

William T. Kincaid, who is well known throughout the East, because of his long connection with the handling of automobile lubricants in that district, has followed Horace Greeley's advice, going as far West as Cleveland, O., where he is now located as special representative for the National Refining Company of that city. Located is hardly the proper word in this instance, since it is Mr. Kincaid's duty to place an agent for the product of the National Refining Company in every city in the country.



W. T. Kincaid, Special Representative, National Refining Company.

He is particularly well fitted for this work, through a long connection with the oil industry, and is entirely familiar with the duties imposed upon him by his new position. His acquaintance in the motor car field is by no means confined to the East, since he has at times been more or less intimately connected with automobile racing, both in his capacity as an oil salesman and as a promoter of such events. His most recent achievement along the latter lines was in connection with the beach races at Old Orchard, Me., in 1911 and 1912.

Mr. Kincaid's many friends, both in and out of the industry, will be glad to learn of his promotion to a wider field of usefulness, and will bespeak for him and the National Refining Company a large measure of success in his work.



### LOCATES IN OHIO.

#### **Maker of Grant Car Purchases the Plant of the Findlay Motor Company.**

Ever since the announcement of the formation of the Grant Motor Car Company of Detroit, for the production of a light weight, low priced car, it has been rumored that the concern would secure a plant outside the so-called heart of the industry. Negotiations were at one time under way, as a result of which it was expected that Dayton, O., would prove the ultimate selection. It is now stated, however, that the Grant company has purchased the factory of the Findlay Motor Company at Findlay, O.

The plant has a floor space of some 50,000 square feet and is modern in every sense of the word. It is stated that it comprises all the necessary machinery equipment for present use and that orders already have been given for sufficient material to warrant the production of 5000 cars. It is expected that demonstrating machines will be shipped shortly to the many dealers throughout the country who have been appointed by Sales Manager George S. Waite.

### NEW EDISON PLANT.

#### **General Manager Bachman Also Denies Rumor Concerning New Edison Battery.**

The immense new plant of the Edison Storage Battery Company at Orange, N. J., is practically completed, and only awaits the installation of machinery to start the production of the Edison alkaline, nickel-iron storage battery on the enlarged basis made necessary by the rapid development of storage battery applications in electric trucks and pleasure cars, street and railway cars, train lighting, wireless telegraphy, railway, police and fire signalling, farm lighting, etc. In this connection Vice President and General Manager R. A. Bachman takes occasion to deny the rumor that a new type of Edison battery is soon to make its appearance.

Mr. Bachman explains that undoubtedly this rumor was started as the result of the temporary laying off of some 100 employees pending the arrival of new machinery and the opening of the new plant. The fact that the company is soon to place in the market a new type of miner's lamp, for which the Edison battery is particularly well adapted and which was awarded the Ratheman medal last year by the Museum of Safety, may also have had to do with the matter.

It is expressly stated by Mr. Bachman that the Edison battery is practically the same today as that perfected by Thomas A. Edison about five years ago, and which has been responsible for the increase in storage battery transportation. Lord & Taylor recently purchased a fleet of electric delivery wagons for its new store, and, following the example of such concerns as R. H. Macy & Co., Hearn's, Loeser's, Abraham & Strauss, Adams Express Company, etc., has standardized on Edison batteries. Mr. Bachman says this is the best evidence that the present type of battery is not likely to be changed.

It is expected that by the latter part of December all the new machinery will have been received and the present machinery so rearranged in more efficient positions in the enlarged plant that an addition of over 2000 new employees will be required.

### WITH NEW MANAGEMENT.

#### **Muncie Gear Company to Continue Business Under a Reorganization Plan.**

Arrangements have been made by the Muncie Gear Company, Muncie, Ind., to continue the business under new management. Thomas W. Warner of Toledo, O., becomes president and the capital stock is increased from \$300,000 to \$500,000.

It is understood that creditors of the company will receive both cash and preferred stock, and that about \$230,000 of the stock has been distributed in this manner. Besides Mr. Warner as president, the new officers are: Vice president, Dr. W. A. Spurgeon; secretary and treasurer, J. Roy Goethus.

### SHARRER TOP ABROAD.

#### **Maker Reports Good Results from Display at Recent Olympia Show.**

The Sharrer Patent Top Company, New York City, maker of the new Sharrer one-hand top, exhibited one of these at the Olympia show in London, England, with the result that it has the promise of a good foreign business. The concern has sold its patent rights for Australia, and has negotiations pending for the sale of such rights in other countries.

Although incorporated but a short time, interest in the product of the new concern has been very marked in this country. The Sharrer top will be seen at New York and Chicago shows.



## LAMBERT LINE HAS MANY REFINEMENTS.

**L**AMBERT pleasure vehicles for the season of 1914 will include two new models, these to be known as model 60 series C and model 46 series C, which embody the same chassis construction as in former designs, with the exception of refinements and added conveniences. The Buckeye Manufacturing Company, Anderson, Ind., has departed from conventional practise, in that option is given of two makes of motors, a Continental or a Rutenber. With the model 60 the choice may lie between four-cylinder units having a bore of 4.125 inches and stroke of 5.25 and 4.25 by 5.25. The cylinder dimensions of the model 46, which is also a four, are 3.75 by 5.25 inches.

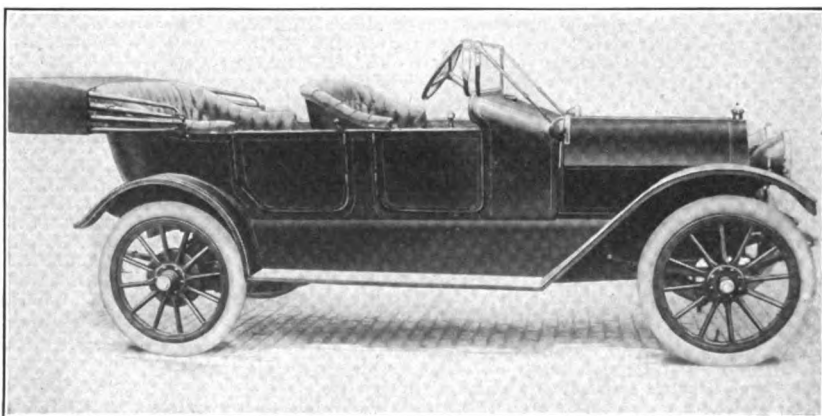
In addition to the changes in the cylinder dimensions, which make for increased horsepower, the steering wheel is placed at the left instead of right, and centre control has been adopted. The shifting lever operating the fibre wheel on the jack-shaft of the Lambert gearless transmission, which provides a multiplicity of speeds, is equipped with a ball top which fits the hand. The emergency brake lever carries an attachment which locks at the will of the operator, preventing use of the car by others than those intended. Keys are provided.

The model 60 has a wheelbase of 117 inches and two types of bodies will be fitted, a five-passenger touring and a roadster. The fuel tank in both designs is located in the dash with a convenient filler. The seats are very roomy and the upholstery very deep, providing the maximum in comfort. Electric lighting and motor starting are supplied at an additional cost.

The model 46 is the newest addition to the Lambert line, and, while it has no untried features, it was designed with a view to offering a lighter car with ample horsepower and seating capacity for five persons. The body lines are stated to be the lowest of any friction driven car offered up to the present time, owing to the special features in the mechanical design. The standard equipment includes an electric motor starter which is guaranteed for life, and any defective material will be replaced free by the maker, provided it gives out under normal serv-

ice. The body is very attractive, being long and low, and has large, roomy seats. The equipment is most complete, including electric lighting, mohair top and cover, speedometer, Titanic front springs and full elliptic rear springs, and all of the minor accessories that make a machine complete for all kinds of service.

The Lambert gearless transmission remains, as in the past 14 years, the stellar feature of the Lambert product. The company points out that the 40 per cent. increase in sales during the past year is indicative of the popularity of this form of transmission and that an increase is anticipated in 1914. The Reynold silent chain for final drive is continued and it is enclosed as formerly in a dust and weather proof case. An equal number of both models will be built dur-



**Model 46 Series C, the Latest Addition to the Lambert Line, a Five-Passenger Touring Car, Fully Equipped.**

ing the coming season, and in these will be incorporated the same high grade material and workmanship for which the product of the Buckeye Manufacturing Company is noted.

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Charles W. Bosworth, Springfield, Mass., referee in bankruptcy, reports that the first dividend of two per cent. has been declared in the matter of the Westfield Motor Truck Company. The trustee has been ordered to pay in full all claims which have been proved and allowed, and are entitled to priority.

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Some little interest attaches to the announcement in England that S. F. Edge, designer of the six-cylinder Napier car, has purchased a 30 horsepower Siddeley-Deasy car equipped with a Knight engine, for his personal use.



## NEW AND NOVEL ACCESSORIES THAT APPEAL TO MOTORISTS

**Mosler Vesuvius Spark Plug.**

A. R. Mosler & Co., Mt. Vernon, N. Y., well known maker of the Mosler Spitfire spark plugs, is marketing the Vesuvius plug, which is designed to withstand severe service. The centre core is of a special stone, practically indestructible, and one of its qualities is that it is so shaped and constructed as to be absolutely gas tight. Another feature is that the plug may be disassembled easily and the parts replaced without interfering with the original adjustment of the points. The last named are of genuine platinum, liberal in size, making for efficiency and durability. The Vesuvius plug is made to fit any motor and is manufactured with various threads. The same high grade workmanship and material for which the product of A. R. Mosler & Co. is noted is incorporated in the new design.

**Ford Gasoline Gauge.**

The Modern Specialty Company, Racine, Wis., has brought out a fuel gauge for model T Ford cars, which is a distinct improvement over the usual method of noting the contents of the container, that of employing a stick or a rule. The Modern gauge is constructed of an outer tube of heavily leaded steel, with an inner casing containing a brass float, fitted to a spiral upright, which turns the indicator on the dial as the fuel is raised or lowered in the tank. The head containing the etched dial and indicator is of heavy brass and is threaded to fit any Ford gasoline tank. The gauge is installed easily and without any alterations by simply removing and discarding the usual filler cap and screwing in the Modern. All parts are substantially constructed and the maker states that there are no parts to become disarranged through service.

**National Foot Scraper.**

More or less mud and dirt is carried into the car, soiling the carpets and robes, and to keep these articles clean the National Motor Supply Company, Cleveland, O., has brought out a useful and inexpensive device, termed the National foot scraper. It is secured to the running board by clamping screws, is very compact and neat in appearance and is provided with a suitable edge for removing deposits from the shoes.

**Fordoid Radiator Hose.**

The importance of having an unobstructed flow of water in the cooling of the motor, especially with the thermo-siphon system, is well understood by those familiar with the internal combustion engine. With the model T Ford motor the outlet water manifold is connected to the radiator by a rubber hose, and to obtain efficiency from the system this tube should be kept clear. With inferior material, the plies of fabric separate, diminish-

ing the diameter of the hose and impeding the flow of the water. The Thermoid Rubber Company, Trenton, N. J., is producing the Fordoid radiator hose especially for the model T Ford motor. Both inlet and outlet designs are made and the maker guarantees that the material will not harden or soften in service, or when various anti-freezing solutions are utilized.

**Rusco Brake Lining.**

Rusco brake lining is produced by the Russell Manufacturing Company, Middletown, Conn., and the maker states that it is constructed of the best quality asbestos, solidly woven and thoroughly impregnated with a special compound to render it water, oil and heat proof. It contains a number of brass wires, these being interwoven with the asbestos. It is produced in standard sizes and thicknesses.

**Dover Breech Lock Oiler.**

The Dover Stamping & Manufacturing Company, Cambridge, Mass., is marketing the Dover wide mouth breech lock oiler, a new design, which makes for convenience in that the spout may be easily and quickly detached and replaced by a rotating movement. This permits of replenishing the supply of fluid without spilling as the opening is ample in size. The oiler is practically a one-piece construction, the bottom being of the best clock spring steel, pressed against the shoulder of the dome, and the seam double turned. The spout and breech are put together in the same manner. No cement, solder or brazing is used in the construction. The oiler is made of the best cold rolled steel, brightly polished, plated and lacquered, and is designed to withstand severe use. It is made in 10 sizes, Nos. 12 to 16, these having capacities ranging from three ounces to one pint.

**Glareless Headlight.**

Otto Luyties, 546 Fifth avenue, New York City, is marketing the Glareless headlight, which the maker states eliminates the dazzling and blinding rays without affecting the efficiency of the lamp. This is held to be due to the type of front glass utilized, it involving details of optical principles which are said to be very complicated. When viewed from the front the effect is that of an attractively frosted globe having a diffused light and showing a relatively small central bright spot. It is stated that this portion is not blinding because it is seen against an illuminated background.

**Kells Tank Cover.**

The W. J. Kells Manufacturing Company, Jersey City, N. J., is producing a cover for tanks, although especially designed for Prest-O-Lite gas tanks. It is constructed of spring metal, a one-piece design, and has a diameter slightly less than the tank and clamps over the last



Mosler Vesuvius Spark Plug



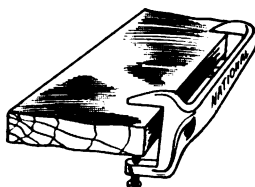
Ford Gasoline Gauge



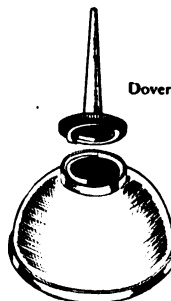
Fordoid Radiator Hose



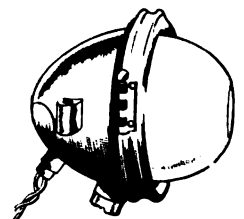
Rusco Brake Lining



National Foot Scraper



Dover Breech Lock Oiler



Glareless Headlight





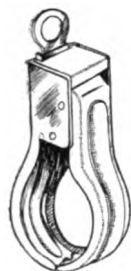
Kelso Tank Cover



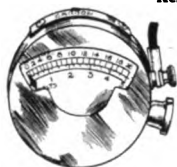
O'Brien Ventilator



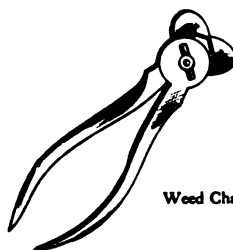
Fairchild Radiator Cap



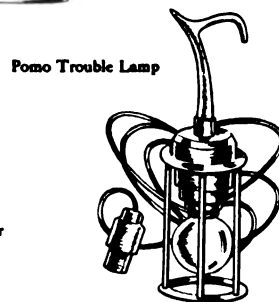
Backus Lock



Kent Pocket Meter



Weed Chain Plier



Pomo Trouble Lamp

named member. One end is rounded while the other is open to permit of inspecting the pressure gauge of the Prest-O-Lite tank. The purpose of the cover is that it can be polished to correspond with the other trimmings.

#### O'Brien Fore Door Ventilator.

The Joseph F. O'Brien Company, 61 Park Place, New York City, is marketing the O'Brien fore door ventilator, an outside view of which is shown herewith. It is so constructed that it can be adjusted to any thickness of cowl or dash by employing different lengths of machine screws. The amount of air admitted is regulated from the inside by turning an inside projection, and the maker states that the vibration will not affect the adjustment. The exterior of the ventilator is covered with a wire gauze, preventing entrance of rain or dust.

#### Fairchild Radiator Cap.

The Fairchild Sales Company, 1777 Broadway, New York City, distributor for the Fairchild Ford crank locks and spring radiator caps, is offering a new Fairchild product termed the bayonet lock radiator cap. It is designed for model T Ford radiators and as the principle involved is similar to the socket utilized in electric lamp connectors, it is removed and replaced easily by a slight movement. The Fairchild is fitted easily and quickly and includes a new cap, loss of which is prevented by the use of a chain, a feature of the Fairchild design. The maker states that the new cap can be fitted in three minutes. It is moderately priced.

#### Backus Lock.

Numerous locking devices have made their appearance on the market, but generally they have been designed to lock a particular component of the car, the clutch, ignition, etc., for example. The Backus, manufactured by the Backus Novelty Company, 512 Water street, Smethport, Penn., differs from these in that it may be employed for a number of purposes. It comprises a pair of movable jaws having an opening of 4.5 inches and a locking mechanism, also a ratchet arrangement which permits of locking in any desired position. The jaws are provided with rounded teeth which will not tear or injure soft materials, as when securing the robe, for example. The Backus may be utilized for locking the gearshift and emergency brake levers together, the ignition and throttle levers, securing the robe to the radiator cap when it is thrown over the cooler, or to the robe rail and numerous other articles carried in the car. No two sets of locks are made alike and the sets of two and three have the same key combination, two keys to each lock.

#### Kent Pocket Meter.

The Atwater Kent Manufacturing Works, Philadelphia, is marketing the Kent pocket meter, which is an automatic volt-ammeter for ascertaining the condition of dry cells and storage batteries. The instrument may

be utilized for testing batteries in connection with automobiles, stationary engines, launches, etc., being calibrated especially for the work. The needle is delicately pivoted and the readings are accurate. One of the qualities of the instrument is that no change is made in the connection to the battery for reading voltage and amperage, as the latter is obtained by simply pressing a button. A flexible lead of ample length is provided with each meter, which is of the dead beat type, insuring accuracy. The Kent comes in a neat hand sewed leather case and is calibrated for both volts and amperes. One of its qualities is the use of a substitute for glass, the maker stating that it is unbreakable.

#### Weed Chain Plier.

The Curreir-Koeth Manufacturing Company, Coudersport, Penn., is producing the Koeth interchangeable tool, to which a large number of heads may be attached to provide for using it as pliers, pinchers or a shearing tool. The automobile kit comprises, in addition to the tool, six heads, including those for obtaining a Weed chain plier as illustrated. This design opens the link easily and for the proper distance, and the maker states that it can be operated easily with one hand. The tool and heads are constructed of tool steel, drop forged, ground and tempered, and it is stated that the heads may be changed as readily as auger bits in a brace.

#### Pomo Pocket Trouble Lamp.

The G. C. Parker Company, 122 Milk street, Boston, is marketing what is claimed to be the smallest inspection or trouble lamp manufactured. It is equipped with a hook member, making for convenience in service, and the lightness of the design permits of hanging it from the button hole of a coat or the brim of a hat. The lamp is an all-metal construction with the bulb protected by a cage. The bulb is a six-volt, six candlepower tungsten. Ediswan sockets are utilized for the lamp base and the battery plug, and are connected by 10 feet of silk cord. The lamp is finished in nickel and is inexpensive.

#### Destroy-O Carbon Remover.

Destroy-O carbon remover is manufactured by the Atlas Supply Company, 3233 West Lake street, Chicago, and comes in 1.5-quart cans. As the name implies it is utilized to remove carbon and other deposits from the cylinders without displacing these members. The fluid is inserted through the spark plug opening and allowed to remain in the cylinders for about 30 minutes, after which it is removed with a grease or oil gun. The motor is then started. The preparation taken from the cylinders may be used over and over again, and the maker states that it will soften the carbon which is carried out in the exhaust. Destroy-O carbon remover is moderately priced and makes for economy in that only a small amount is employed in each cleaning process. The Waite



Auto Supply Company, 81 Exchange Place, Providence, R. I., is representative for the maker.

#### A C Titan Spark Plug.

The Champion Ignition Company, Flint, Mich., maker of the Champion spark plugs, has brought out a new design which is stated to be regular equipment on Cole and Cadillac cars. A very large porcelain, easily replaced, is employed, and it is maintained that the dimensions make for durability and efficiency. The centre electrode is screwed into the porcelain and cemented. A special washer is fitted to the top of the porcelain and pressed down with a closed nut to prevent leakage. The bottom of the porcelain has a very wide seat and where it takes its bearing in the shell is fitted with a corrugated aluminum washer. It is stated that the last named member conducts the heat from the porcelain. Both the centre and shell electrodes are substantial, the latter being blade shaped, and have an increased diameter at the point of contact with the shell to draw the heat. A cool plug is claimed for the design of the electrodes, making for more satisfactory operation of the motor at low speeds.

#### Breaznell Clips.

J. H. Breaznell, 26 Court street, Brooklyn, N. Y., is marketing the Breaznell clip and terminal connector for batteries and spark plugs. One of the qualities of the

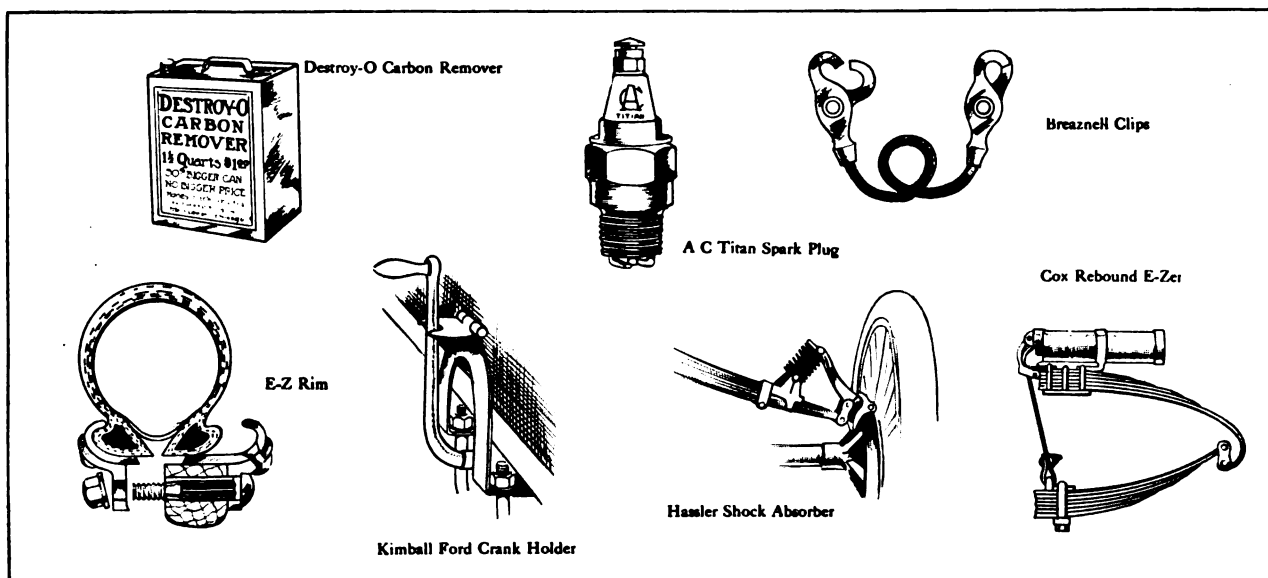
tool, other than the brace wrench supplied with each equipment, is necessary to remove and replace a tire. With the E-Z the clincher shoes may be utilized until worn out and replaced by quick detachable types, a universal arrangement. The company manufactures a rim for model T Ford cars which are fitted with clincher rims.

#### Kimball Ford Crank Holder.

To retain and prevent the swinging of the starting crank, the Northern Specialty Company, Crystal Falls, Mich., has brought out a special design for model T Ford cars. It is attached easily as shown, and a hinge member permits of holding the crank in an upright position when not in service. Provision is made for locking the handle, thereby preventing use of the car by others than those intended. An opening is provided in the hinge member for the locking device. The Kimball crank holder is inexpensive.

#### Hassler Shock Absorber.

Robert H. Hassler, West 10th and Canal streets, Indianapolis, Ind., has brought out a new type of shock absorber for model T Ford cars, which differs materially from conventional designs. The absorber includes a spiral spring of tempered spring steel which takes up all jolts and jars without hampering the movement of



clip is that it can be attached to a spark or other terminal without displacing the usual nut. The Breaznell clip is provided with two gripping jaws, which may be expanded and contracted easily. A lock washer construction is included, so that when the spark plug nut, for example, is screwed down, vibration cannot loosen the clip. Provision is also made for retaining the bared end of the wire and clamping it securely, and without the use of solder. The clips are well made, substantial and inexpensive.

#### E-Z Rim.

Many owners desire to obtain the advantages and convenience of the quick detachable rim, but hesitate to make the change owing to the alterations and expense involved. With some types of rims it is necessary to cut down or build up the felloe and sometimes the spokes must be altered. The E-Z Rim Company, 146 Summer street, Boston, is marketing the E-Z rim, which presents interesting and practical advantages, in that the maker states that it can be applied to any automobile wheel without alterations and at a moderate cost. As will be noted by the accompanying illustration, the use of split rings, cams, levers, etc., is eliminated in the E-Z, it comprising a removable ring to which lugs are fitted, these retaining it to the rim proper by means of bolts. The method of retention is similar to that employed with demountable types, six nuts and bolts anchoring the ring to the felloe. One of the qualities of the E-Z is that no

the car spring. The end of the car spring is supported by a lever arrangement and in such manner that when the spiral spring is compressed, the end of the car spring yields downward over a range of 1.25 inches. The rebound or expansion of the vehicle spring is retarded gradually by an extension of the lever member, which engages with the axle at the time of the upward movement. The lever member is held stationary during the movement and by reason of the compression of the spiral spring, holds the leaf or car spring down. The same principle is used for the rear of the machine.

#### Cox Rebound E-Zer.

The Cox Brass Manufacturing Company, Albany, N. Y., is manufacturing the Cox Rebound E-Zer, which retards the rapid upward movement of the car springs by means of a friction clamping device and gradually allows the springs to expand to their normal position. The action of the friction clamps is entirely automatic, as they open when the springs are compressed and grip on the rebound. The clamps are fitted with cylinders enclosing compression springs, to which is attached an especially treated woven heavy canvas belt, 1.5 inches wide. This belt is water proof and feeds through the automatic friction clamps, and is fastened on the axle by special clips provided for this purpose. The E-Zer is applicable to all types of springs, and does not affect the resiliency of the car, loaded or empty, as it does not come into action until the rebound occurs.



## WRIGHT COMPANY ANNOUNCES AEROBOAT.

**A**LTHOUGH the Wright brothers were engaged in experimental work upon an hydroaeroplane before the appearance of the first



New Wright Aeroboat in Flight Near Dayton, O.

successful machines of this type, the plans apparently were abandoned for a time. It is generally conceded that the first flying boat of the fuselage float type was designed by Grover C. Loening and exhibited at an aeroplane show in New York City late in 1911. Subsequently, Loening became associated with the Wright Company at the plant in Dayton, O., and for the past year or more he has been developing a machine of this type under the direction of Orville Wright.

Recently the Wright Company announced a Wright model C-H equipped with pontoons, and this was held to be a satisfactory flying machine adapted for use in shallow water. The next step was to so perfect this design as to make the craft suitable for use in rough water, and this is believed to have been accomplished in the Wright aeroboat shown herewith.

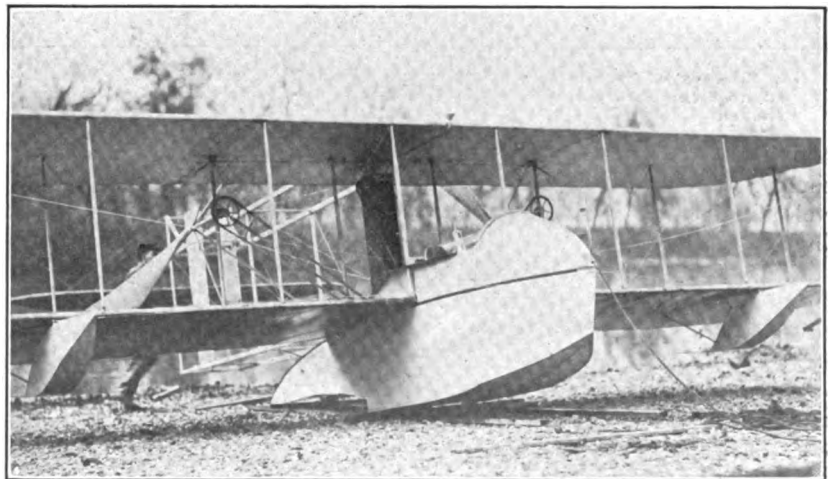
It will be noted that the plane construction follows the standard Wright design, to which has been attached a modified Loening fuselage float, and two Wright pontoons midway between the central boat hull and the tips of the lower plane. The details of the float and pontoons are not made public, but it is explained that the arrange-

ment is such as to make for a better co-ordination of the aeroplane surfaces and rudders, and the closer proximity of the line of thrust to the centre of weight. In addition, the form of boat hull has been studied so that air pressures on it will add to the natural stability of the machine, instead of detracting therefrom. The Wright Company claims for this aeroboat a marine aeroplane that is absolutely seaworthy and one which enables the sportsman to really enjoy flying, not only because of the safety of the machine but because of its perfect balance and control in the air.

Orville Wright has been testing the aero-boat on the Miami river, back of hills and dales in different kinds of winds to determine its stability and has declared it satisfactory in every respect. Last month, Oscar Brindley, with Grover Loening as passenger, secured what is said to be a new record in this respect, by rising from the water in a run of only 200 feet.

In this connection it also may be stated that the Wright Company has recently brought out a new Wright biplane, model E, which is the first produced by this concern equipped with only one propeller. Other features of construction follow closely standard Wright practise, but the details have been worked out a trifle differently to accommodate the single propeller. The total weight of the machine is 730 pounds, and demountable features are incorporated so that it is possible to prepare it for shipment within 12 minutes after it is rolled into the hangar.

The company is also announcing a new six-cylinder motor fitted with Zenith carburetors.



Indicating Construction of Wright Aeroboat Fuselage and Disposition of Pontoons on Lower Plane.



## PRODUCING MULTIBESTOS BRAKE LINING.

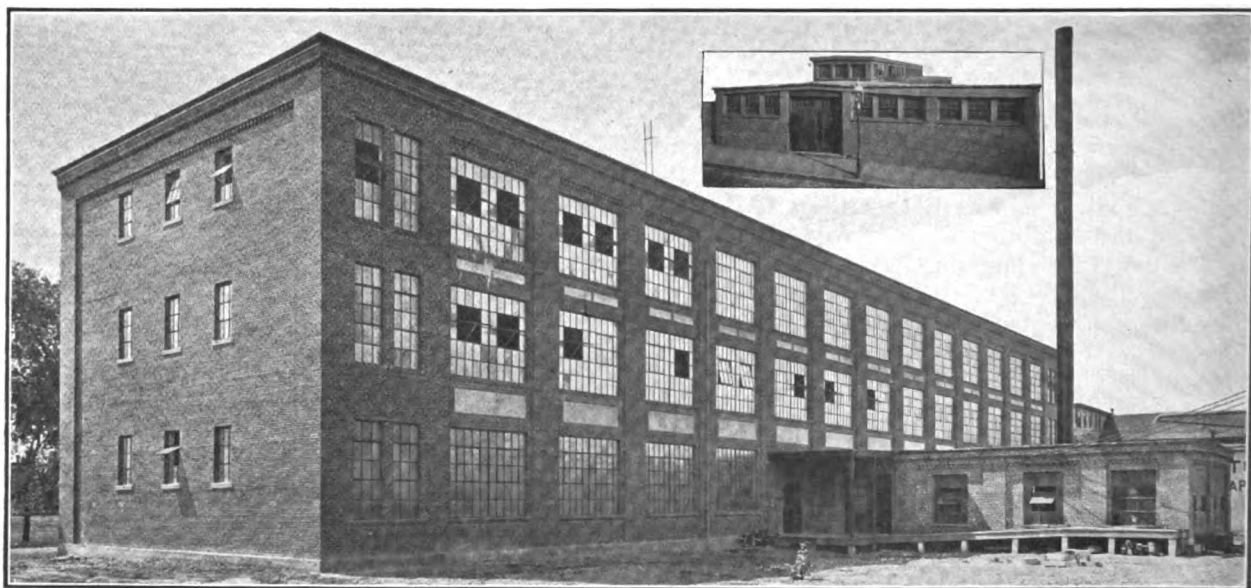
How Asbestos Is Woven into a Homogeneous Mass and Treated to Withstand Friction Stresses at New Factory of Standard Woven Fabric Company.

(By C. P. Shattuck.)

**T**HERE is no component part of the motor car, unless it be the steering mechanism, that is more necessary to its safe operation than the brakes. That designers attach considerable importance to these members is emphasized by the fact that at least two independent sets of brakes are provided, either of which when properly constructed and adjusted is capable of locking the wheels. The efficiency and dependability of modern brakes—which may be said to receive

velocity of the rubbing surfaces and the coefficient of friction. The durability of the material depends to a great extent upon the temperature it attains, and this in turn is influenced by the pressure required to resist the motion of the rubbing surfaces.

The early designs of brakes were of the metal-to-metal type, but this construction is not favored, because a certain amount of lubricant is necessary to prevent cutting of the surfaces and



**New Factory of Standard Woven Fabric Company, Framingham, Mass., Maker of Multibestos Brake Lining—Some Idea of the Enormous Growth of Business May Be Obtained by Comparison with Worcester Plant, Seen in Inset.**

too little attention from the average user—are due to the careful and scientific study and development of the friction material, or brake lining.

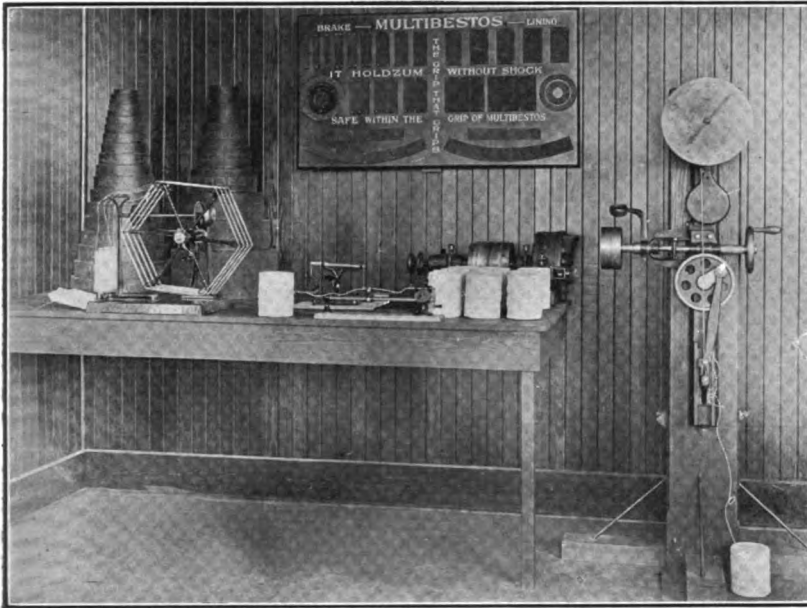
Few motorists realize the energy which must be absorbed before a machine is brought to rest after being in motion. If a car be set in motion by the power of its motor and the energy be cut off, it will not come to a stop until this momentum is overcome by the friction of its bearings, the rolling friction and air resistance.

The capacity of a brake is dependent upon the total area of the surfaces in contact, the pressure per square inch with which they are held, the

heating, and the oil causes a decided loss in efficiency.

The very high heat resistance of asbestos early attracted the attention of engineers as a possibility for a friction material, but difficulties were experienced in producing a homogeneous mass; one that would not disintegrate, glaze or present uneven surfaces. Among those who gave these problems serious consideration was the Multiple Woven Hose and Rubber Company, Worcester, Mass., which concern was engaged in the manufacture of solid multiple fire hose fabrics and solid cotton belting. The difficulties were ultimately overcome by the construction of





**Section of Testing Room Where the Asbestos Yarn Is Tested for Tensile Strength, Weight, Twists, Etc.**

special looms and the treating of the asbestos fabric with a compound, resulting in the production of Multibestos, a trade name well known throughout the automobile industry.

In March, 1911, the Standard Woven Fabric Company was incorporated under Massachusetts laws and in April of the same year took over by purchase the business of the old concern.

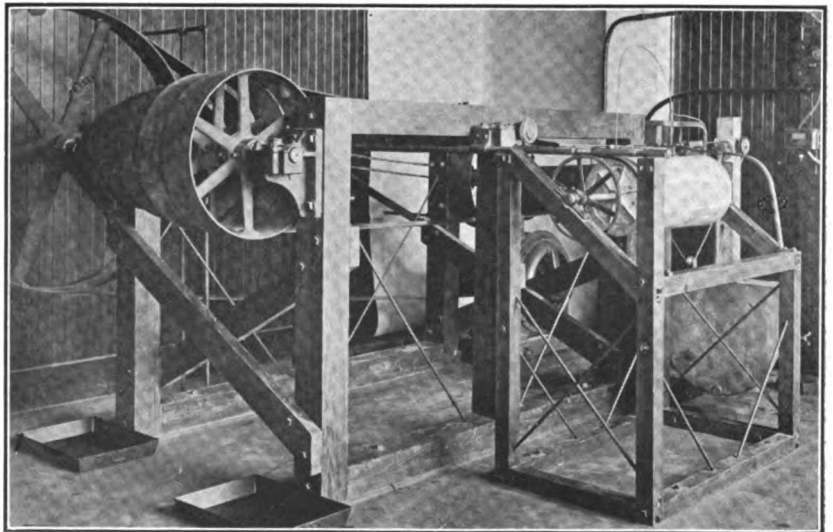
The company began operations in a brick building at 7 Summer street, Worcester, Mass., the two floors and a basement providing about 12,000 square feet of floor space. Shortly after, Multibestos brake lining was offered to the trade. Technical tests and actual service demonstrated its efficiency and durability and in 1912 the demand for the material assumed such proportions that it was necessary to add a second plant, this being located on Arch street and being known as the brake lining factory. In it was the machine shop, where the special looms for weaving the yarn were made and assembled.

The business grew rapidly, showing an increase of fully 400 per cent. in two years, and the capacity of the Arch street plant proving inadequate, it was found necessary to provide for increased facilities and a new factory. After a thorough in-

vestigation it was decided to locate at Framingham, Mass., on the Boston & Albany railroad. The new building was started about Dec. 1, 1912, and the removal of machinery from the two Worcester factories was completed Aug. 1. The manufacture of Multibestos brake lining, multiple woven fabrics and solid woven cotton belting was resumed shortly after.

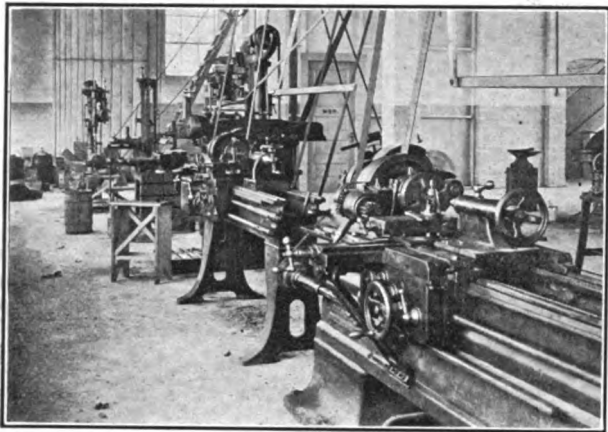
The new factory provides 50,000 square feet of floor space, is pleasantly located, and is designed and equipped to overcome the many problems of quality production. It exemplifies the value of scientific methods of manufacturing and it is a structure in which the efficiency of the manual worker is developed to a high degree, in that ample light

and pure air are provided in the rooms. No matter how warm the day, the difference in the temperature and quality of the air upon entering the building is very noticeable. A certain temperature and humidity are maintained, summer and winter, throughout the plant, by the Sturtevant Carrier Air system, which may be termed an air laundry, in that the atmosphere is washed of all impurities, saturated with moisture, forced to each room, drawn from each department, and again washed. By this method any predetermined temperature may be maintained.



**Machine Designed by Chief Engineer E. E. Walte for Testing Brake Linings —The Same Conditions to Which Linings Are Subjected in Service Can Be Produced Accurately.**





**A Portion of the Machine Shop Where the Components of the Special Weaving Looms Are Constructed.**

The building itself is of re-enforced concrete and brick construction, fitted with sprinklers throughout. The ground floor is divided, one-half being utilized for the offices, laboratories, testing rooms, etc., and the remainder for the stock and shipping departments, and winding rooms. The other floors are devoted to the weaving and treating departments and machine shop. Steam is supplied by a Robb-Brady marine type boiler of 150 horsepower capacity. As all of the units are driven by direct connected electric motors, and the building throughout is lighted by electricity, a large generating set will soon be installed.

The process of making the 90 to 95 per cent. asbestos yarn into a homogeneous mass and treating it without injuring the original vitality of the material is an interesting one. The asbestos is mined in Canada and spun into a three-ply yarn having two strands of brass wire and wound onto reels or spools, according to specifications of the Standard Woven Fabric Company, which hopes soon to manufacture its own material from the raw products.

The yarn is tested for tensile strength, weight and number of twists, by machines designed for this work and shown in an accompanying illustration. After testing for tensile strength, the material is placed in the twisting machine, which determines accurately the number of twists to a three-inch strand, a factor making for strength of the material. It is next wound onto a reel,

which mechanically indicates on a dial the number of yards of the material to be weighed. These tests are conducted carefully and the limits are very close.

From the testing room the yarn goes to the winding room, where a special machine is employed for winding it onto tubes. This machine may be said to handle the delicate material with gloves, in that the yarn is wound without loss of the fluffy asbestos.

One entire floor is devoted to the looms which weave the yarn into compact form and into the shapes and thicknesses shown in an accompanying illustration. The weaving rooms are accessible only to the officials of the company and certain employees, as the machines embody valuable features not found in other looms, which produce a brake lining retaining non-glazing, non-granulating qualities under the most severe conditions of service. The efficiency of these looms is such that the yarn is woven with slight loss of material, and production is aided by maintaining the proper moisture and temperature. Some idea of the capacity of the machines may be obtained from the dimensions of the material, Multibestos being produced in thicknesses of .125, .15625, .1875, .25, .3125, .375 and .5 inch, and in widths varying by quarters from one inch to eight. It will not be long before looms will be operating, producing these goods in the solid weave up to 20 inches width.

The yarn fed from the tubes into the looms presents an appearance similar to a maze of white wires, and emerges in the form of a white tape, which is wound on special reels. Each machine has a capacity of over 1000 feet daily, and



**A Corner of the Shipping Room. Showing Various Sizes of Multibestos Brake Lining Awaiting Shipment.**





George D. Moore, President, at Left, and Arthur H. Burdick, Treasurer and General Manager, at Right.

some idea of the annual output of the company may be gained by the statement that if the brake lining were made into a continuous length, it would reach over 1000 miles, or approximately from New York City to Chicago by the shortest road route.

From the weaving room the lining is taken to the treating department, where by a special process, involving the use of a chemical compound which permeates every fibre of the fabric, the material is rendered heat, dust, water, oil and grease proof. After passing through the various processes, the lining is fed through what is termed a gravity elevator, each length passing through a sized compartment to the floor below, where the trade mark of the company, Multibestos, is stencilled with aluminum letters. The machine was designed and constructed in the machine shop of the company, and in addition to marking the material, measures and reels it into 100-foot lengths. These rolls are next taken to the stock room and made ready for shipment, a spur track leading to the factory providing excellent facilities.

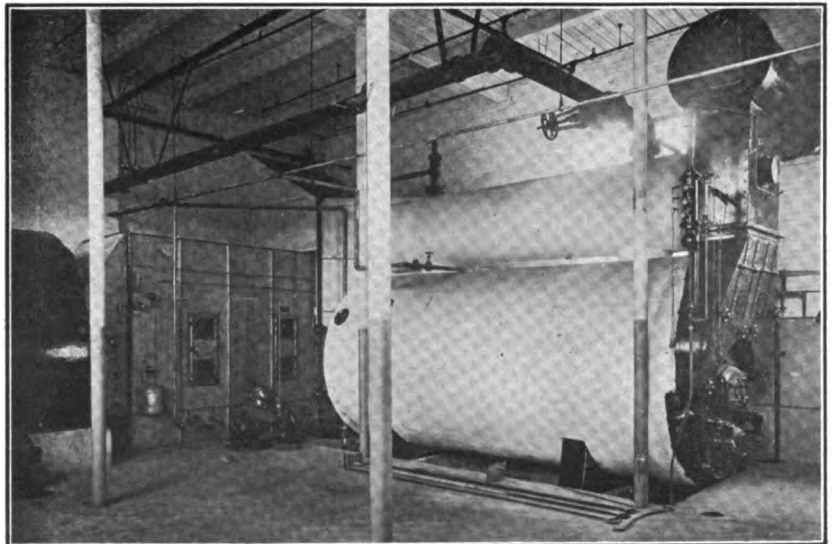
In addition to producing standard sizes of Multibestos brake lining, the company manufactures special sizes to order. One of the specialties produced is a special lining for Ford cars, the Ford Motor Company specifying a material having the same qualities as Multibestos, but without the brass wire. Another feature is that this lining must not be affected by oil, and

the chemical treatment of Multibestos Ford Special fully meets this requirement.

The Standard Woven Fabric Company has in the process of construction machinery for producing Multibestos facing for the various forms of clutches employing a dry friction material, and the plans include the manufacture of standard and special sizes. The flexible qualities of Multibestos make it adaptable for other than service with motor cars, it being utilized for clutches in mill transmission equipment, mining machinery, cranes, hoists, elevators, presses, etc., where a material having a high coefficient of friction is desirable.

One of the most interesting departments in the factory is the testing room, in which is located the machine utilized for testing brake lining, and which is shown for the first time in an accompanying illustration. It is the creation of E. E. Waite, the chief engineer of the company, and on it can be produced exactly the same conditions to which brake lining would be subjected in actual service.

These include, as previously pointed out, the coefficient of friction, the pressure required to resist motion of the contacting surfaces, speed, temperature, chatter, etc.; in fact, those factors entering into the efficiency and durability of the friction material. The action of water, oils and greases is noted by immersing the band carrying the lining in these liquids. Any desired speed may be produced, equalling that of an automobile travelling at a few miles an hour to the maximum, and the action resulting from the



Power Is Supplied by a Marine Type of Boiler of 150 Horsepower Capacity—A Certain Temperature and Humidity Are Maintained Throughout the Plant by the Sturtevant Carrier Air System (Shown at the Left), Which May Be Termed an Air Laundry.





Edwin E. Waite, Factory Manager, at Left, and T. J. Daley, Secretary, at Right.

gradual application or locking of the brakes is charted on a revolving drum.

Throughout the factory is noted every modern convenience tending to promote the quality of Multibestos brake lining and other products of the concern, and a large force of machinists is employed in executing new designs of looms and machinery by which the output may be augmented, as the business is steadily increasing.

The Standard Woven Fabric Company has prospered to such an extent that since its incorporation the annual dividend of six per cent. has always been paid on its outstanding preferred stock. The capital consists of \$200,000 preferred and \$200,000 common stock, both carrying a par value of \$100 a share. The stock is closely held, largely by those directly connected with the management of the affairs of the company. At no time has the stock been placed in the hands of underwriters, but has always been disposed of by the directors and officials. Quite a block of the common stock still remains unissued, and this will be held in reserve to provide additional working capital or further extensions, if required. The success of the company is attributed to the use of the highest grade of material and the most rigid inspection of it, and the workmanship entering into the construction of Multibestos and the other products.

The officers of the Standard Woven Fabric Company elected at the time of the organization are the same as today and are as follows: President, George D. Moore, Worcester, Mass.; vice

president, W. B. McSkimmon, Boston; treasurer and general manager, A. H. Burdick, Framingham, Mass.; secretary, T. J. Daley, Worcester, Mass.; factory manager, E. E. Waite, Framingham, Mass. The board of directors comprises the above-named officers and William Lowell Putnam, J. H. Drury, Stoughton Bell and Ashton L. Carr, all of Boston.

### NEW BALTIMORE HOME.

#### H. W. Johns-Manville Company Removes Branch to Enlarged Quarters.

The Baltimore branch of the H. W. Johns-Manville Company, in order to properly take care of the big increase in the volume of business, has been compelled to seek larger quarters. The new home which the company has secured is a six-story building with inside floor measurements of 47 by 187 feet.

The building, which is located at 207 East 13th street, is within two blocks of the postoffice and is right in the heart of the business section of the city. In addition to large warehouse accommodations, it will include an attractive store and up-to-date offices, while for the purpose of facilitating the handling of shipments there will be a railroad switch running into the building.

De Palma, Bragg and Wishart are expected to be at the wheels of the three Mercer cars entered for the fourth international sweepstakes, 500-mile race, which will be run on the Indianapolis speedway on Memorial Day, 1914.



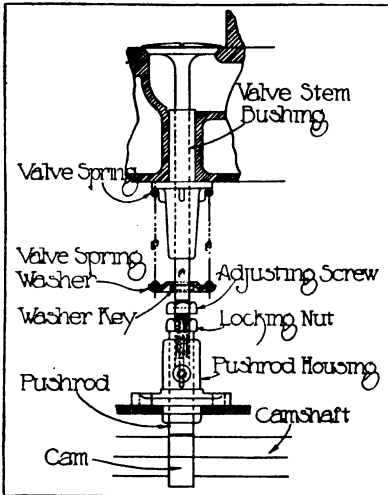
Offices of the Standard Woven Fabric Company Are Spacious and Well Lighted.



# MECHANICAL INSTRUCTIONS FOR NEW OWNERS.

## Valve Assembly of Inter-State and Timing Diagrams of Several Models--Replacing Worn Fibroid with New on Metz--Cadillac Starting System.

**I**N THESE days, with the car manufacturer equipping his product with a motor having reserve capacity, the average owner does not



Valve Assembly of Inter-State Motor.

the engine will not develop anywhere near its rated energy. Other factors may enter into the problem, such as ignition and carburetion, but even with these in perfect order it is obvious that the valves must function correctly if satisfactory results are to be anticipated.

In an accompanying illustration is shown the valve assembly of the model 25 Inter-State car, manufactured by the Inter-State Automobile Company, Muncie, Ind., the components being lettered to make plain their operation. The valve proper is held on its seat by the valve spring, which is normally compressed by a washer retained by a key. The valve is lifted by the head of the adjusting screw, a part of the pushrod, and this is raised by the cam. As shown in the drawing the valve is seated, and it will be noted that a space exists between the head of the adjusting screw and end of the valve stem.

With this design the valve should lift .3125 inch and for this purpose a predetermined space must be maintained between the head of the adjusting screw and the valve stem. If the space be increased through wear, etc., it is obvious that the intake valve, for example, will open late and that the efficiency of the cylinder will be considerably impaired.

give the power plant that attention necessary with early designs which required frequent tuning up. The efficiency of the poppet valve type of motor depends largely upon the proper openings of the valves and if these do not conform to the factory timing

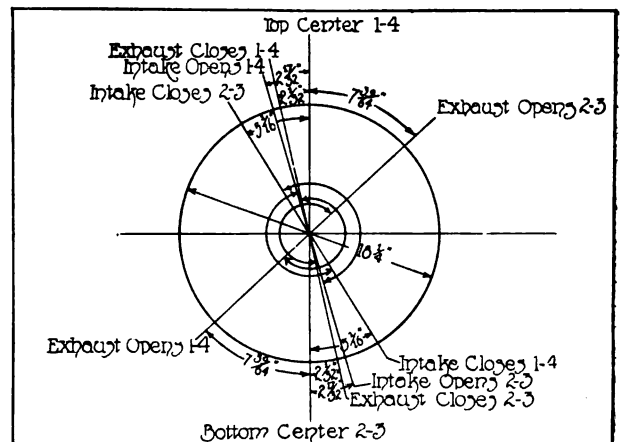
Provision is made for compensating for wear by raising the adjusting screw, this being accomplished by loosening the locking nut and rotating the screw member to the left. While some utilize a business card, a sheet of paper, etc., to determine the space, the method is not recommended if accurate adjustment is desired. The better plan is to utilize the marks on the periphery of the flywheel.

This is not difficult if one will bear in mind that the piston of each cylinder makes four strokes—intake, compression, firing and exhaust—and that the crankshaft and flywheel make two complete revolutions. In laying out a timing diagram, the circle represents the flywheel and it is divided, the uppermost point denoting top centre and that diametrically opposite the bottom centre. These represent the piston at the top and bottom of its stroke, and generally the flywheel of a motor is thus marked.

The timing diagram of the Inter-State four-cylinder motor fitted to the model 25 car is shown herewith. The power plant is of the L head type and is equipped with a flywheel having a diameter of 18.25 inches. The timing of the motor is as follows:

Intake opens 2.53125 inches before centre.  
Intake closes 5.0625 inches before centre.  
Exhaust opens 7.609375 inches past centre.  
Exhaust closes 2.03125 inches before centre.

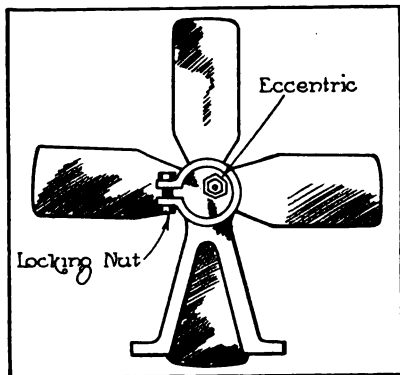
These are the flywheel markings as shown in the diagram, which depicts the periphery of the flywheel marked off in inches to simplify matters,



Timing Diagram of Inter-State Model 25 Motor. Showing Opening and Closing Points of Valves.



although degrees are also utilized. It will be seen that the intake opens 2.53125 inches before top centre and closes 5.0625 inches before bottom



Adjusting Mechanism of Overland Fan Belt.

centre, during which time the fly wheel has not made a complete half turn.

These points are checked by utilizing the indicator or arrow or the centre of the rear cylinder or crankcase. For example: If it

be desired to check the timing, rotate the flywheel until the marks 1-4 register with the indicator, when either the pushrod of the first or fourth cylinder should start to lift the valve. If not, the space between the rod and valve stem is too great and the adjusting screw previously referred to should be raised until it makes contact with the valve stem and starts to lift it. The closing point is checked similarly. The opening and closing points of the remaining valves are also checked in the same manner. It is better for the novice to adjust both the intake and exhaust of one cylinder and not attempt to pass to the intake valve of the second cylinder.

The following is the timing of models 50, 40, 35 and 30 Inter-State motors:

#### Model 50.

Four-cylinder motor, T head type. Pairs. Bore five inches, stroke six. Diameter of flywheel 18.25 inches. Valve lift .375 inch.

Intake opens 2.5 inches before centre.

Intake closes 5.5 inches before centre.

Exhaust opens 9.0 inches past centre.

Exhaust closes 2.0 inches before centre.

#### Model 40.

Four-cylinder motor, L head type. En bloc. Bore 4.5 inches, stroke 5.5. Diameter of flywheel 16.75 inches. Valve lift .375 inch.

Intake opens 3.50 inches before centre.

Intake closes 5.00 inches before centre.

Exhaust opens 7.00 inches past centre.

Exhaust closes 1.17 inches before centre.

#### Model 35.

Four-cylinder motor, T head type. Pairs. Bore 4.75 inches, stroke 5.5. Diameter of flywheel 18.25 inches. Valve lift .25 inch.

Intake opens 1.5 inches before centre.

Intake closes 5.5 inches before centre.

Exhaust opens 9.0 inches past centre.

Exhaust closes 2.0 inches before centre.

#### Model 30.

Four-cylinder motor, L head type. Pairs. Bore 4.5 inches, stroke five. Diameter of flywheel 18.25 inches. Valve lift .375 inch.

Intake opens 1.5 inches before centre.

Intake closes 5.5 inches before centre.

Exhaust opens 8.5 inches past centre.

Exhaust closes 1.0 inches before centre.

## OVERLAND FAN ADJUSTMENT.

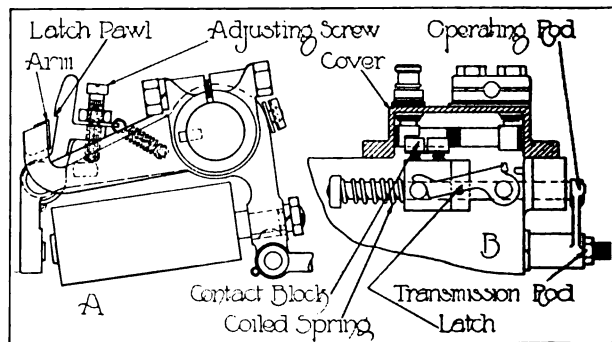
The adjustment of the fan belt of models 69 and 71 Overland cars is very simple, it involving the loosening of a locking nut and rotating an eccentric until the belt is sufficiently tight. The components utilized in this work are shown in an accompanying illustration and after adjusting the belt the lock nut should be set up snugly.

## CADILLAC STARTING SYSTEM.

There are two components of the Delco lighting and motor starting system that may require attention after considerable service, according to the instructions issued by the maker of the 1913 Cadillac car. These are the magnetic latch, shown in detail at A, and the generator switch depicted at B in an accompanying illustration.

The magnetic latch, when energized by current from the battery, causes the mechanism operating the starting transmission and generator switch to be linked to the clutch pedal shaft, and consequently to be thrown into operation by the depression of the clutch pedal. The magnetic latch pawl is adjustable by means of a screw and the last named member should be so set that the arm will pass the pawl, permitting the points indicated by the points of the arrows to clear each other when the main clutch is disengaged. Raising the screw increases the distance and moving it downward decreases it. The lock nut should be set up firmly after the adjustment is made.

The generator switch, shown at B, is mounted on the starter transmission housing, and when in a forward position connects the generator windings with the cells. When at the rear, it completes the path for the current through the motor windings. Beneath the cover are three con-



Cadillac Starting and Lighting System: A, Magnetic Latch Adjusted by Means of Screw; B, Contact Blocks of Generator Switch Which May Require Cleaning.

ductors having terminals, and under these is mounted a sliding contact block which presses against the conductors in the cover. These blocks



form a part of an operating rod, the exposed end of which is connected by an arm to the transmission operating rod. The sliding contact block is not directly fastened to the pull rod, but is forced into its starting and operating positions by collars, a coiled spring being interposed between the block and collar upon the forward end of the pull rod and the rear collar, abutting directly against the sliding block. A latch engaging with pins upon the sliding block, serves to retain it in a forward position.

When the clutch pedal is depressed as in starting, the interconnected operating rods of the switch and transmission are pulled to the rear. The action of the switch operating rod is to first compress the coiled spring against the sliding block. When the pull rod nears the limit of its travel, the rear collar upon the switch rod trips the latch retaining the sliding block in its forward position, and the pressure of the coiled springs snaps the block into its rear position, permitting current from the battery to flow through the motor windings. The sliding block does not change its position until the sliding gears are fully meshed.

It is pointed out that should the energy imparted to the flywheel decrease below normal, and when the cells are fully charged, the generator switch cover should be displaced and the contact blocks and bars inspected. If these be dirty, creating resistance to the passage of the current, they should be thoroughly cleaned. If pitted, grinding with a valve compound is recommended. They should be cleaned after the work and lubricated with a light oil.

### REPLACING METZ FIBROID.

One of the qualities of the Metz friction drive is the ease with which adjustments and replacements are made. Energy is imparted to the jackshaft or driven wheel by a friction wheel in the design manufactured by the Metz Company, Waltham, Mass., as shown in the accompanying drawing. The jackshaft wheel carries what is termed a fibroid, which is made in two sections to make easy displacement as well as renewal. It is retained by a band which is secured by bolts as shown in the sketch.

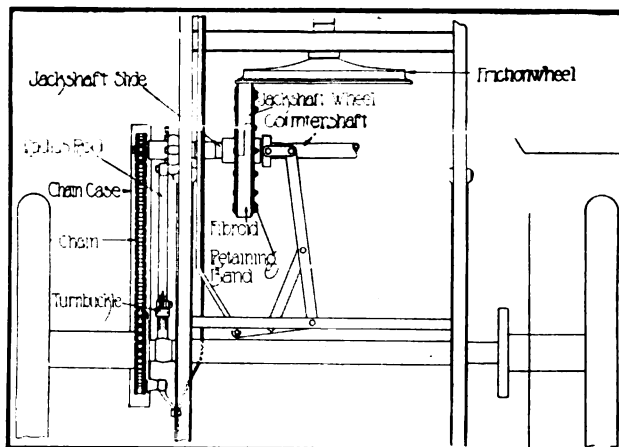
Wear of the fibroid is automatically taken up, but after considerable service and when it has become so worn that the clutch pedal must be pushed to its maximum, a new adjustment must be effected in the distance between the friction wheel and the driven member. This is obtained by adjusting the nuts on the clutch pedal and

drive plate bracket rods, and with the clutch pedal released.

To replace a worn fibroid with new, the bolts and retaining band are removed, the new halves inserted and the components rebolted. This may be accomplished easily by the owner as the parts are very accessible and do not require that any fitting be accurately made.

It is advisable to open and clean the chain cases and chains at least once a month. Wash the chains thoroughly in gasoline or kerosene, then immerse and boil in a mixture of mutton tallow or beef fat and powdered graphite. This will penetrate all points subject to friction.

The chains are adjusted by rotating the turnbuckles on the radius rods and in doing this work it is important that an equal number of turns be given each turnbuckle to preserve the alignment of the road wheels. If these be suspected of be-



Driving Mechanism of Metz Car, Showing Retention of Fibroid of Driven Wheel and Turnbuckles Utilized in Adjusting Chains.

ing out of line they should be checked up with the front members. It is important that the front wheels be kept aligned, for if these members are out of true rapid wear of the tires will result.

### PAINT FOR MOTORS.

The maker of the K-R-I-T cars recommends the use of Venetian black for painting the motors or touching up the worn paint.

### CARE OF UNIVERSAL JOINTS.

The following suggestion is made by the maker of the Premier cars and it is one that should be followed: At least once a season disassemble the universal joints and thoroughly clean, inspect and repack with grease.





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## THE REGISTRATION FEE.

Organized motorists appear to be having little difficulty in convincing the judiciary of the unconstitutionality of some of the motoring laws which have been passed by state legislatures. The Mississippi supreme court set the example by declaring the law in that state null and void, and practically the only provision of the discredited statute was that for a registration fee. One of the lower courts in Ohio has now found the registration provisions of the Warnes law, passed at the last session of the legislature, to be a form of double taxation and therefore contrary to the supreme law of the commonwealth.

Immediately after the Mississippi decision was made public the American Automobile Association announced its intention of taking a New

Jersey test case to the United States supreme court. In the meantime, the Ohio motorists have not been idle, and it would appear that the latest success has spurred the automobile owners in other commonwealths to action. The new California statute is to be tested in like manner, and it is understood that the Michigan supreme court is to have opportunity to pass upon the recently enacted law in that state.

In each instance the objection has been based upon the registration provision. In Ohio, California and Michigan, motorists have been called upon for nominal fees only until now. The new laws seek to impose a graduated fee, based upon the horsepower rating.

From the first the various state legislatures have contended that they were acting in this matter solely because of the police powers reserved to the state authorities. Motorists are themselves somewhat to blame because the fees have been placed at a figure much higher than necessary to pay the expenses of the system. In the days when the agitation for improved highways had not made the converts it now enjoys, automobile owners expressed themselves as willing to be taxed in this manner, providing the fund thus created should be applied to highway construction.

However satisfactory this arrangement may have been in the first place, it has resulted in a gradual increase in this form of taxation until at present it would appear that many legislators feel that whenever more money is needed the motorist is the logical source. And it has also raised the proposition that since automobiles wear the highways unduly they should be made to bear the larger share of the expense of construction and maintenance, which is entirely beside the case.

It is particularly interesting to note the activity of the organized motorists in the states named, since it is bound to have a wholesome effect upon the legislatures in other commonwealths. During the past two years there has been plenty of indication that legislators were anxious to increase registration fees and enact other regulations which could not help but be detrimental to the industry. Manufacturers and dealers would do well to study this situation in the several states and lend such assistance as may be desirable in securing the judicial determinations needed.

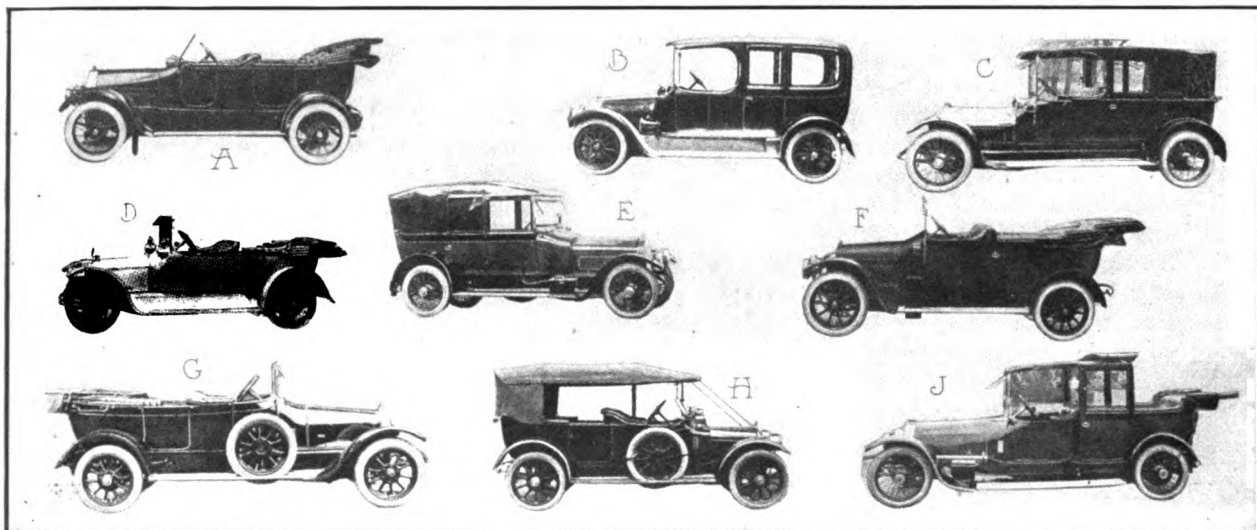


## TWELFTH ANNUAL SHOW AT OLYMPIA.

**P**ERHAPS the chief feature of the 12th automobile show of the Society of Motor Manufacturers & Traders in Olympia, London, England, last month, was the appearance of so many small cars. These were in no sense cyclecars, not even as cyclecars are classified in Great Britain, but for the most part miniature automobiles equipped with four-cylinder motors rated at 12 horsepower and under. No less than 23 different makes were rated at 10 horsepower or less. Of course, the rating is based upon the bore, as the Royal Automobile Club's formula is the same as that of the Society of Automobile Engineers in this country, but the piston dis-

character than the Paris Salon which preceded it by a few weeks. Of the 127 makes on display, 47 were produced in England, 36 in France, 10 in America, nine in Italy, nine in Belgium, eight in Germany, three in Scotland, two in Switzerland, and one each in Austria, Holland and Spain. The American manufacturers represented were the makers of Buick, Cadillac, Hudson, Hupmobile, Mitchell, Oakland, Overland, Regal, Stanley steamer and White.

While six-cylinder cars are somewhat more popular in Great Britain than in Continental Europe, it is of interest to note that but one British maker, Rolls-Royce, is producing sixes exclu-



Some Interesting Designs Revealed at Olympia Show: A, Humber Open Type; B, Delaunay-Belleville Limousine; C, Crossley Three-Quarter Landaulette; D, Panhard Touring; E, Wolseley Touring; F, Benz Cabriolet; G, Talbot Torpedo; H, Austin Vitesse Phaeton; J, Sheffield-Simplex Landaulette.

placement in cubic inches is correspondingly small.

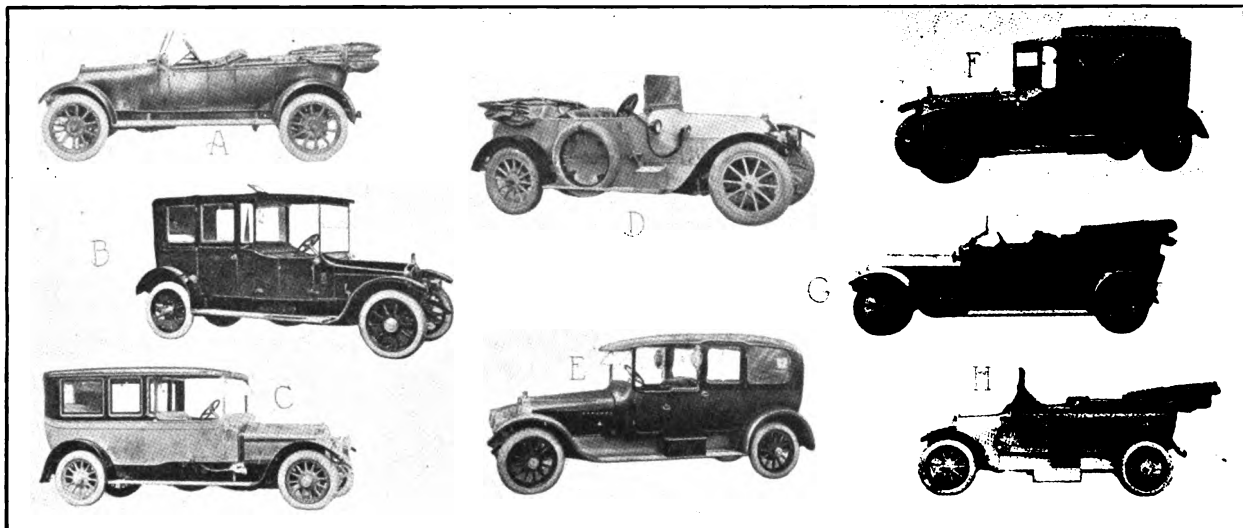
For the first time in the history of the industry British manufacturers were willing to admit that there had been little reason for making changes in design. This means that in a large number of instances makers have listed their last year's models with the statement that these have proved so satisfactory in service that only changes in the nature of refinements have been necessary. Others frankly state that they have made no changes whatever in last year's design. This would seem to indicate that motor car construction has reached a certain standardization abroad, as undoubtedly has been true in this country.

The show was decidedly more international in

sively. One and two-cylinder engines always have been found in the Olympia display, but this year the number of these was reduced very materially. It follows that the four-cylinder car is the prevailing type.

The matter of relation of stroke to bore is one which has interested British manufacturers and owners for the past two years at least. This has been due to the method of taxation, which is based upon the horsepower rating under the R. A. C. formula. The tendency has been toward the selection of a maximum stroke and then to vary the power of the motor by varying the bore. Perhaps a majority of the British makers favor a maximum stroke of 130 mm (5.1 inches), but the number of those who have selected 150 mm (5.9 inches) has grown very materially during





**Additional Models Seen at Olympia: A, Humber Touring; B, Austin Landaulette; C, Wolseley Limousine; D, La Buire Touring; E, Vauxhall Limousine; F, Argyll Limousine; G, Armstrong-Whitworth Touring; H, Adler Cabrio-Landaulette.**

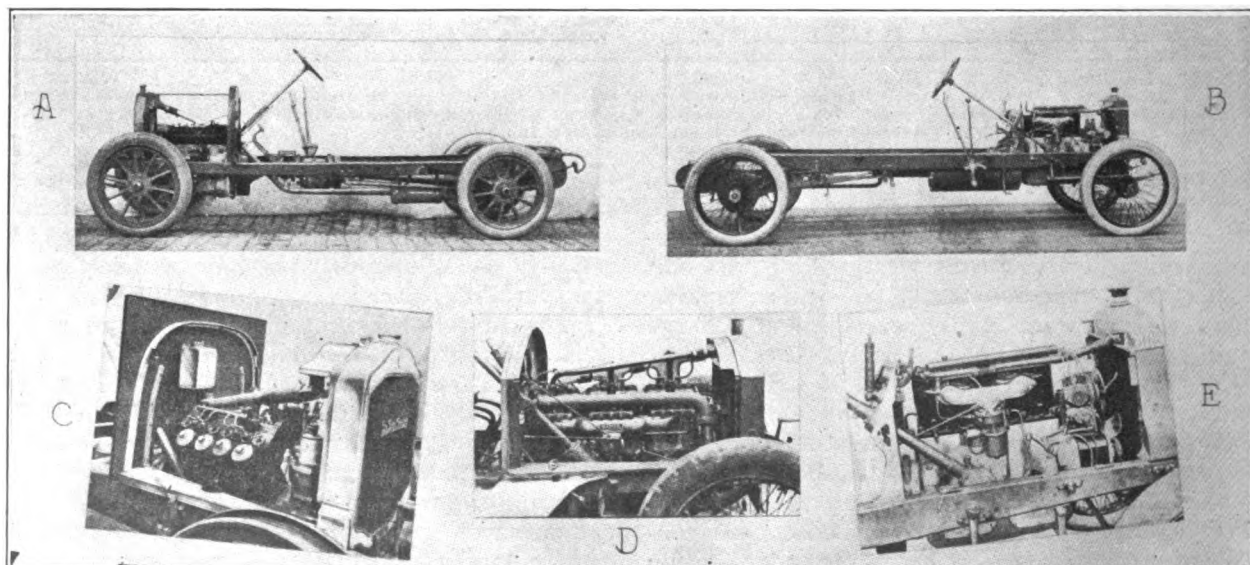
the past year, and a stroke so nearly approaching six inches for four-cylinder engines is no longer looked upon as excessive.

The practise of casting the motor en bloc has gained many advocates, even among those who at one time declared they would have nothing to do with it. This applies to the four-cylinder unit, of course, though there is more than one maker of a six who follows the same practise. Usually, however, the six-cylinder engine is cast in pairs or triplets.

The Daimler and the Siddeley-Deasy are the

only British cars which utilize non-poppet valve motors exclusively, both being fitted with the Knight sleeve valve engine. The Knight and Argyll, the latter having a single sleeve instead of two, have more than held their own. The Itala with its rotary valve engine now has three models instead of one. A new engine of this type is the Maudslay-Reno, which employs a single short sleeve above the piston to open and close the ports in proper sequence.

As was expected motor starters were very much in evidence. It does not surprise Ameri-



**Chassis and Motor Details at Olympia: A, Benz 12 Horsepower Model, Typical of Small Cars Produced Abroad; B, Daimler 20 Horsepower Chassis; C, Eight-Cylinder, 26 Horsepower De Dion Motor; D, Six-Cylinder 30-35 Horsepower Napier Engine, Which Recently Completed Alpine Test Trip; E, Daimler Engine, Showing Starting Dynamo.**

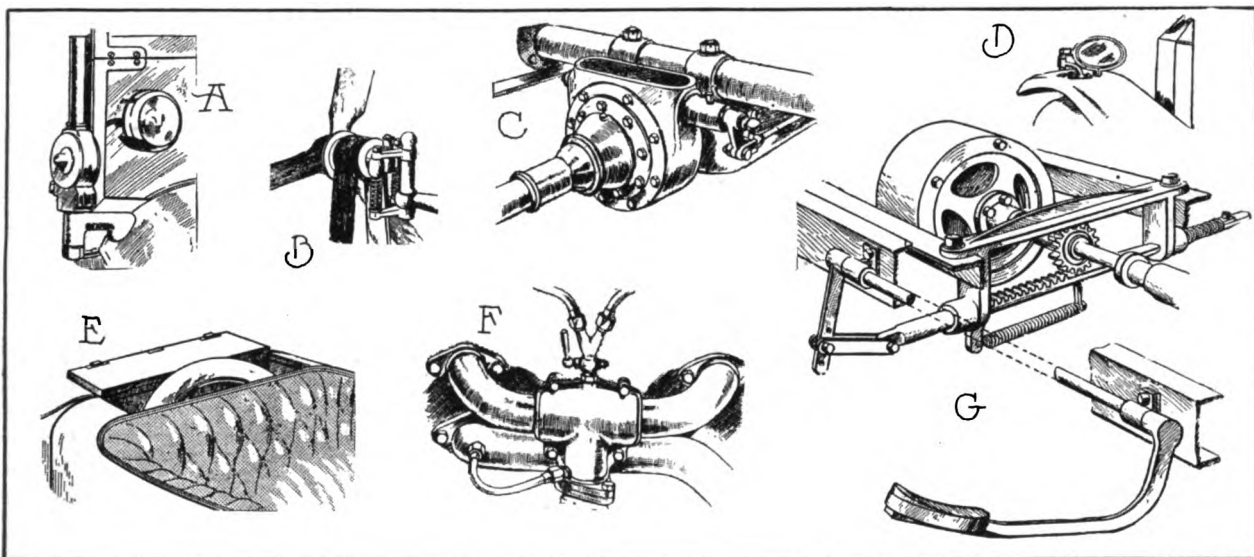


can motorists to find that a majority of these were of the electric type, but British writers have been warm advocates of the compressed air starter and some of them attribute the preponderance of the electrical devices to the widespread adoption of electric lighting. It is true that the subject of lighting has been given decidedly more consideration by British motorists and manufacturers during the past year, with the result that many of the chassis now have provision for the installation of a lighting generator, and it is but a short step to the addition of the starting mechanism.

The air starters fall into two classes, that utilized by the S. C. A. T. and Wolseley, requiring a special distributor and separate piping to the engine, and the type used on the Sunbeam, which

individual specifications, or at least by a manufacturer who specializes in coach work. Heretofore this plan has resulted in the exhibition of many extreme designs, but this year these were by no means so prominent. Some of the new body types, such as might be regarded as standard equipment in America, are presented herewith.

Other illustrations indicate some of the chassis constructional details which should prove of interest to American readers. It will be noted that in most instances these partake of innovations which might be classed as making for convenience or comfort in operation, in which respect the foreign designers appear to be following the example of American constructors. Space does not permit of extended comment upon each



**Constructional Features on Foreign Cars: A, Side Lights Set in Base of Windshield on Fiat; B, Springs on Opel Fan Bracket; C, Enclosed Brake on Riley Propeller Shaft with Provision for Air-Cooling Through Gauge Top; D, Driving Mirror on Front Mudguard of Metallurgique; E, Spare Wheel Locker at Back of Front Seat on Hurtu; F, Singer Water Jacketed Induction Pipe; G, Foot Operated Engine Starter on English Jackson.**

comprises an air driven motor, acting as a starting engine for the motor proper. The electric starters also are divided into two classes, one being that in which the charging dynamo and the starting motor are separate units, and the other that in which both are combined and known in Great Britain as a dynamotor. The electric starter on the Sheffield-Simplex is described by British writers as the most startling innovation, in that the dynamotor takes the place of the fly-wheel.

The matter of body design is one in which British motorists have long considered themselves proficient. It will be remembered that the usual practise abroad is to purchase the chassis separately and have a body installed to

of the examples shown, but it is anticipated that the reader will have little difficulty in understanding the details as presented.

Shortly after his arrival in Indianapolis, after being away for three months on the trans-continental test trip, H. C. Bradfield, field advertising manager of the Cole Motor Car Company, left for another journey of a similar character to the West and Pacific Coast.

E. C. Patterson, who has entered three Mercedes cars for the fourth annual 500-mile race at Indianapolis, is negotiating with Pilette, Salzer and Lautenschlager to act as pilots for these machines.



## WITH THE CYCLECAR MANUFACTURERS.

**First Organization in This Branch of the Industry Is Formed in Detroit---Makers Discuss Possibility of Uniform Nomenclature---New Designs Revealed.**

**W**HAT'S in a name? Shakespeare is authority for the statement that "A rose by any other name would smell as sweet". Perhaps the same rule applies to the cyclecar. That is to say, the demand for a miniature automobile, selling at a price well below that which has hitherto been regarded as possible, undoubtedly will be quite as insistent no matter what the manufacturers decide to call their product. It is somewhat significant, however, to find some 40 persons connected with this branch of the industry in Detroit meeting in the Hotel Pontchartrain to discuss the relative merits of cyclecar, voiturette and motorette as a term by which to describe the new type of vehicle.

The outcome of the discussion appears to have been in doubt, except that the term voiturette was omitted from the name of the organization which was perfected at the conclusion of the meeting. So far as is known this is the first association of cyclecar enthusiasts and the name is the Detroit Cyclecar and Motorette Club. Other clubs are to be organized in the near future, and it is proposed that the question of name shall be decided by a convention of such organizations to be held in the near future.

In the meantime, new cyclecar companies will be formed, and other manufacturers will announce small cars, voiturettes, motorettes and cyclecars indiscriminately. There are said to be 31 of these concerns in Detroit alone, either with vehicles in the course of construction or contemplating actual work within a few weeks. There are no means of knowing how many more there are in other cities, but new companies are making their appearance every week.

By the way, the officials of the Detroit Cyclecar and Motorette Club are as follows: President, F. E. Spooner; first vice president, J. P. LaVigne, LaVigne Cyclecar Company; second vice president, J. J. Batterman, Scripps-Booth Cyclecar Company; third vice president, C. F. Gazeley, Detroit Commercial Axle Company; fourth vice president, I. N. White, Princess Cyclecar Company; secretary, P. A. Teats, P. E. T. Cyclecar Company; treasurer, R. C. Albertus, Mercury Cyclecar Company; directors, the above and K. L. Hermann, Hermann Cyclecar Company; W. J. Marshall, Mercury Cyclecar Company; Ernest

Weigold, Detroit Cyclecar Company; J. F. Wilkinson, Wilkinson Starter Company; S. A. Clinton, Detroit Cyclecar Company; James Scripps Booth, Scripps-Booth Cyclecar Company; A. J. Farmer, Farmer Manufacturing Company; Theodore F. Millington, Detroit Body Company; H. S. Baker, Hinchman & Baker, and P. Heseltine, Gadabout Motor Company.

### A CYCLECAR TRANSMISSION.

The Fuller & Sons Manufacturing Company, Kalamazoo, Mich., well known in the industry as a producer of automobile parts for a number of years, has brought out a small two-speed planetary transmission, suitable for cyclecars and other small machines. It is stated that light weight with maximum strength has been attained in this design without sacrificing quality, and that by the use of high grade materials throughout, it will handle small four-cylinder motors of 2.75-inch bore and four-inch stroke on cars weighing up to 1000 pounds.

A multiple disc clutch is utilized, giving very easy engagement. All the gears are hardened and many of the parts are drop forgings. Bands are also supplied for either chain or shaft drive, and equipped with levers for tightening the bands onto the transmission drums. The low and reverse may be operated by pedals, and the high speed may also be actuated in a similar manner. The maker claims superiority for this type of drive, on the ground that it is positive, has a sufficient number of speed changes and will be durable and efficient.

### MALCOLM DESIGN READY.

The Malcolm Jones Detroit Company, which had its inception in Detroit last May, has been devoting its attention to the experimental work necessary to the production of a satisfactory model, and is now prepared to make public the accepted design. It is stated that one of the Malcolm cyclecars is now undergoing a road test in the mountains of Pennsylvania, and that deliveries will be made shortly. In the spring it is proposed to open a branch factory in Windsor, Ont., to take care of the Canadian demand.



Provision is made for two passengers, arranged tandem. The motor is in front under a foreign cyclecar type of hood, and the air openings thereto are covered with wire screens, surrounded by nickel plated rims. The wheelbase is 100 inches and the tread 36. The weight is 560 pounds.

It is maintained that the cooling system is somewhat new. The motor is an air-cooled, two-cylinder V unit rated at 10-15 horsepower. Back of each cylinder is a separate fan, driven by a single belt, and a V shaped air deflector is set in the centre just forward of the motor. Lubrication is by a piston pump. The carburetor is a special type and the magneto a high-tension instrument. Starting is accomplished by a detachable crank operated from the seat, with an automatic device for releasing compression.

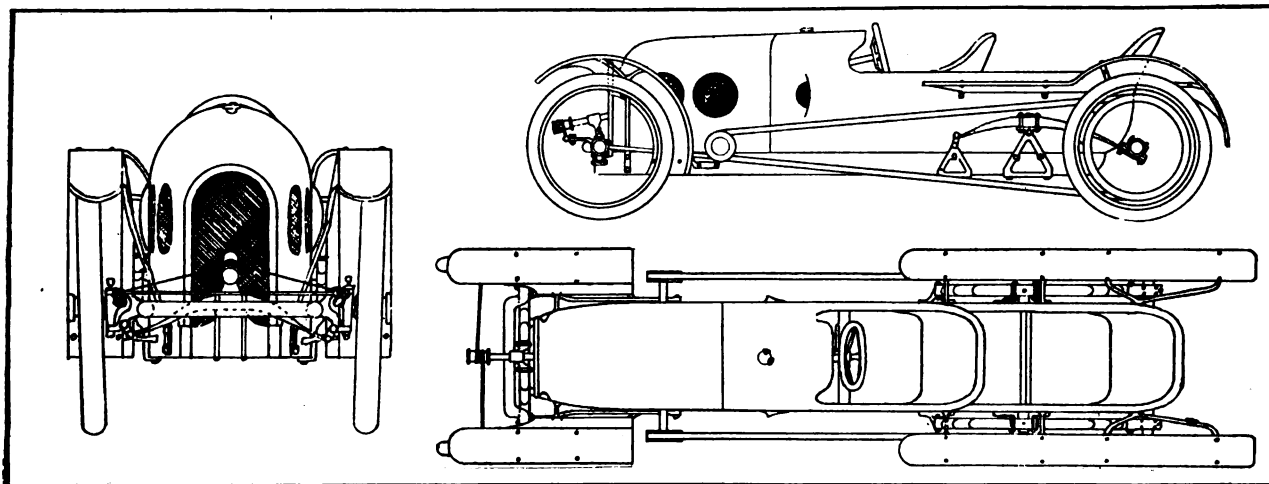
Another departure from American cyclecar

which the maker calls special attention, are as follows:

The front end is attached to brackets by means of a U shaped shackle, snugly fitted, which permits freedom of movement endwise, but does not allow any motion sidewise. The rear end is attached by plates and bolts to a sleeve which pivots on the rear axle. Reverse leaves are built up with the spring, each spring having one leaf at its underside and at the centre and rear end. These leaves are so formed that they do not stiffen the spring under normal conditions, but only come into action on the rebound, or extreme deflection, thus eliminating the possibility of breakage and crystallization from excessive bending. This construction makes auxiliary shock absorbing devices wholly unnecessary, gives ample road clearance and freedom from side swing when passing over rough roads at high speed.

### LA PETITE IS RECALLED.

Nine years ago, J. P. LaVigne of Detroit, constructed a little car "within the reach of all", and listed it at \$375. His plan was to reach the masses with a machine that could be sold to meet



Accepted Design of Malcolm Cyclecar, Which Presents Novel Features in Its Treatment of the Body Lines.

design is found in the friction transmission, which is of the standard automobile type, affording any number of speeds forward and reverse. Final drive is by long 1.125-inch V belts from jackshaft pulleys to the rear wheels. Hard wood blocks working in the rear wheel pulley grooves provide the necessary braking effect.

Steering is by a special piano steel cable wound around a bobbin attached at the extreme forward end of the steering rod. Springs are fitted at either end of the cable to take up all slack. A single transverse spring of the platform type is mounted over the forward cross member of the body sills, while the rear springs are of the cantilever type. The axles are tubular, and radius rods hold them in their relative position with the body. Wire wheels, fitted with 28 by 2.5-inch tires, are employed.

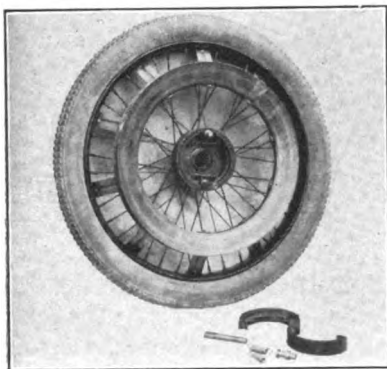
Details of the rear spring suspension, to

the demands of almost everyone with any means at all. The original creation was called La Petite and exhibited at an automobile show in Detroit, but for some reason the general public was not yet ready for this type of vehicle.

Mr. LaVigne is one of the pioneer automobile manufacturers, in that he produced his first car in New Haven, Conn., in 1899. This was with a three-cylinder, two-cycle motor of the horizontal type. In September, 1902, he started work upon a machine which embodied features that were not perfected until many years later, these including a motor starter, reversible engine, worm drive, etc. This car was burned at New Haven, but not until after it had been demonstrated that the starter was a practical device, in that it started the motor without cranking after it had been left standing for 64 hours in a temperature far below freezing.



This bit of ancient automobile history is recalled in Detroit, by the announcement of Mr. LaVigne's re-entry into the motor car manufacturing field with the LaVigne Cyclecar Company of that city. The details of the new machine, which will be known as 'the LaVigne, have not yet been made public, but it is understood that it will be equipped with a



Rear Wheel Construction on Falcon.

four-cylinder, air-cooled motor, underslung pressed steel frame, sliding gear transmission, 96-inch wheelbase and 50-inch tread. Its weight will be about 600 pounds. It will be understood that Mr. LaVigne has designed a number of successful cars since the days of his earlier experiments and that he has by no means been out of the industry, although he has not been found in its list of manufacturers for some little time.

#### DETAILS OF FALCON DESIGN.

Because of a misunderstanding on the part of the motoring public, it has seemed desirable to Francis R. Hoyt, designer of the Falcon cyclecar, to state that this machine is the product of the Falcon Cyclecar Company, Wright building, Cleveland, O. All correspondence should be addressed directly to the company.

Two views of Falcon components are presented herewith, and special attention is directed to these details. It is maintained by the company that the construction of the front axle is such that, by the use of a bracket of novel design, there is a single point of suspension for the frame. This is held to permit either front or either back wheel to be elevated without disturbing the level of the frame, and thus confines road shocks to a single wheel to the axle instead of transmitting it to the frame.

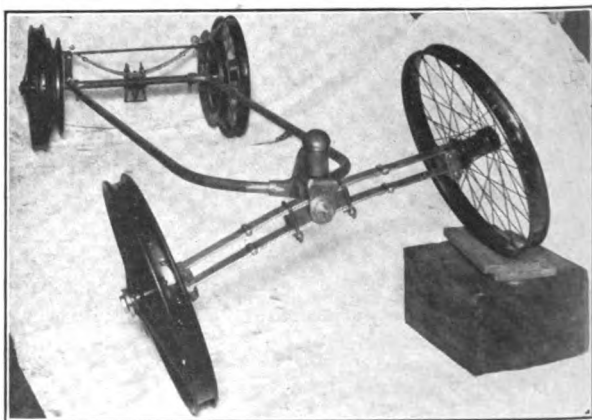
A forward extension, in the form of a swan's neck steel piece or bracket, terminates in a lock socket which provides a bearing for a king bolt and fork. The fork carries a casting between its jaws on a horizontal pivot. To this casting are fastened two sets of parallel springs, of two

leaves each. Each main spring is shackled to the other at both ends, and the spindles are formed integral with the shackles. The movement of the axle in steering is controlled by means of steel cables from a sprocket and chain operating from the end of the steering column. When one wheel hits an obstruction, the axle, consisting of the two springs, rocks in the fork and the springs combine to take care both of the shocks and the recoil.

The rear spring is a reversed cross arch. To either side member of the frame, which is of seamless tubing, a bracket is fastened, the upper end of each being shackled to an end of the rear spring. This leaves the frame of the car at axle level, while it gives, in combination with the front bracket design, a three point suspension. Frame distortion is held to be impossible, either from road conditions or when there is a single occupant in the car.

Another feature of the Falcon design is found in the rear wheel construction. It is maintained by the designer that large rear belt pulleys are not feasible for rutted roads, and this condition has been met by a smaller rear pulley, the gear reduction being secured by chain drive from the driven disc on the friction transmission to a second jackshaft. This permits of the use of a larger forward belt pulley.

It also will be noted, from an accompanying illustration, that this company has made use of the internal expanding brake. The Falcon brake is said to give a braking surface sufficient to hold a vehicle five times its weight in an emergency. Both rear brakes operate by pedal, on which there is fitted an equalizer designed to insure



Illustrating Falcon Frame Design and Provision for Travelling Over Rough Roads.

equal application of pressure to both wheels. An emergency brake lever, with ratchet stops, operates the same brakes.



**PIONEER FROM CHICAGO.**

The American Manufacturing Company, 29 South La Salle street, Chicago, announces the Pioneer cyclecar, which embodies features not heretofore brought to the attention of the public by the American manufacturer. This is particularly noticeable in the seating arrangement, provision being made for two passengers so placed that the driver's back is on a line with the front of the other seat. The wheelbase is 96 inches, tread 40 and weight 550 pounds.

The motor is a twin-cylinder unit, set at an angle of 45 degrees, with rating of 12-15 horsepower, and is specially designed for cyclecar service. Cooling is by air and lubrication by piston pump. The carburetor is a standard float feed with compensating air valve. Ignition is by dual type Briggs high-tension magneto.

The transmission is of the friction type, and is ball bearing throughout. In keeping with general cyclecar practise in this country, provision is made for four speeds forward and reverse, each speed being locked when set by a device connecting the shifting rod with the clutch pedal. Final drive is by riveted block belt to pulleys fastened direct to rear wheel drums, on which the brakes, pedal operated, also act.

Springs are semi-elliptic transverse, one at each end of the frame. Axles are of the strong tubular type, rigidly stayed by truss rods. Both are cranked slightly to afford ample clearance for movement. Wire wheels are utilized, the hubs being fitted with self-contained ball bearings. Tires are 28 by 2.5 inches.

Accompanying illustrations indicate the general appearance of the completed vehicle, and the plan view presents the seating arrangement, location of the throttle, spark and speed changing controls on the dash, and the position of the motor and transmission at the forward end. The equipment includes a top, top boot, windshield, storm curtains, horn and starter.

It is understood that the American Manufacturing Company has subjected one of these cars to a series of road tests covering several months and expects to be in a position to make deliveries in a very short time. It is prepared to make demonstration of the vehicle at any time, and it is stated that the concern has made arrange-

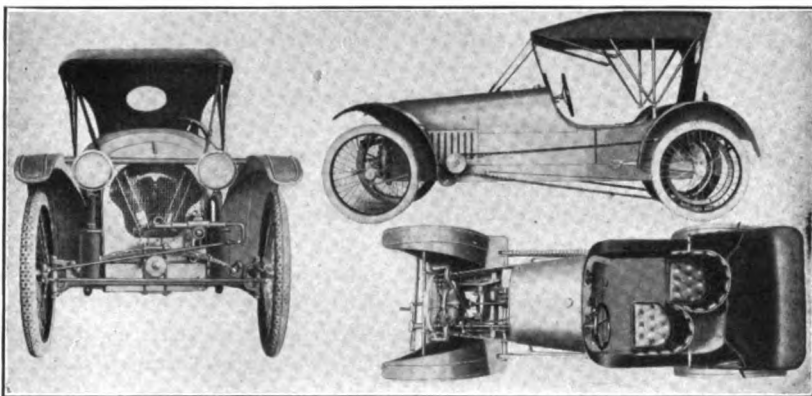
ments for speedily placing the new design on the market when production plans shall warrant.

**CYCLECAR NOTES.**

J. J. Batterman, sales manager of the Scripps-Booth Cyclecar Company, Detroit, reports that his company expects to begin deliveries on the Rocket cyclecar about Jan. 1. This is the machine which recently underwent a 1000-mile road test in the Middle West with decidedly satisfactory results.

The Comet is the name of a new cyclecar design from Indianapolis. It is equipped with a twin-cylinder motor, planetary transmission, final drive by belt, motorcycle wheels, tandem seating arrangement of body and 36-inch tread.

Dayton, O., is one of the latest cities to report a cyclecar, this being known as the Dayton. The machine has wheelbase of 104 inches,



Three Views of the Pioneer Design, Indicating Distinctive Seating Arrangement and Other Details of Construction.

36-inch tread, tandem seating arrangement, twin-cylinder motor, friction transmission, wire wheels, etc.

The Warren Electric & Machine Company, Indianapolis, Ind., announces that it soon will place a cyclecar on the market. The machine will be designed by E. A. Shelley and Theodore A. Meyer and it is anticipated that it will present a number of innovations.

A. R. Lambert, general sales manager of the Buckeye Manufacturing Company, Anderson, Ind., maker of Lambert cars, states that he has information that an impression has been created that this concern is interested in some manner with the development of a cyclecar now being produced in Louisville, Ky. He adds that the Buckeye company has no connection whatever with this proposition and that the Lambert factory has not been used at any time for the development of this cyclecar.



# CORRESPONDENCE WITH THE READER.

## Adjusting Ford Tappets.

(1672)—I have a slight knock in the motor of my model T Ford, which seems to be in the pushrods, although they appear to be tight. I would like to have

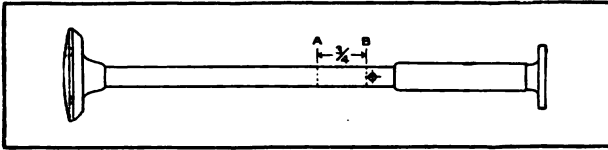


Fig. 1—Method of Lengthening Ford Valve Stems.

your opinion as to what causes it as I have had several garagemen work on the car, but they have been unable to fix it. I would also like to know how to adjust the pushrods.

FRED C. GOODALE.

Madera, Cal., Nov. 17.

Too much space between the valve stems and the pushrods may be responsible for the noise referred to, but it would be more of a click than a knock. It is difficult to diagnose the cause of trouble from the description given and it would appear to the writer that any Ford expert should be able to eliminate the noise.

The maker of the Ford motor states that the clearance between the valve stem and pushrod should never be greater than .03125 inch or less than .015625 inch. If the space be larger than .03125 inch, the valve will open late and close early, resulting in an uneven running of the engine. If less than .015625 inch the valve may remain partially open.

There are two methods of readjusting the space between the valve stems and the pushrods—by drawing out the stems or utilizing the adjusters marketed for this purpose. The first named plan involves removing the valves from the cylinders and drawing out the stems as shown at Fig. 1. The stem is drawn out at the point indicated between A and B, or about .75 inch and just above the opening utilized by the cotter pin.

The simplest method is to obtain the adjusters, which may be secured at any supply house. These are especially designed for the Ford motor, and are easily fitted. The adjusters consist of hardened steel caps which are fitted to the end of the valve stem or pushrod. They are fitted by raising the valve and slipping over the stem, and if necessary the space may be decreased by utilizing thin discs, a number of these being provided and of varying thicknesses to permit of accurate work. In fitting these members allowance should be made for the expansion of the stems when hot. Full directions accompany the adjusters and it is likely that resetting the valves will cure the trouble mentioned.

## Racing Cars.

(1673)—Do racing automobiles use piston rings?

WALTER BUTMAN.

Lawrence, Mass., Nov. 9.

The pistons of motors fitted to racing chassis are equipped with rings.

## S. A. E. Horsepower Formula.

(1674)—Will you please publish in your Correspondence with the Reader column the A. L. A. M. formula, also the S. A. E., for computing the horsepower rating, and explain the difference between the two?

A SUBSCRIBER.

Newark, N. J., Nov. 21.

The formulae referred to are identical, the Society of Automobile Engineers having taken over the data of the Association of Licensed Automobile Manufacturers, which organization has disbanded. The formula is as follows:

Square of bore x number of cylinders ÷ 2.5.

It is based on an assumed piston speed of 1000 feet a minute.

## Straight Storage Battery Lighting.

(1675)—Will you please publish the proper method of wiring a car for electric headlights employing a storage battery as a source of current supply?

OLD SUBSCRIBER.

Watertown, N. Y., Nov. 10.

A wiring plan for electric headlights is presented at Fig. 2, two wires being employed instead of grounding one side of the battery. The diagram includes the tail light, but this member could be eliminated. The leads are easily noted, being depicted by black and dotted lines.

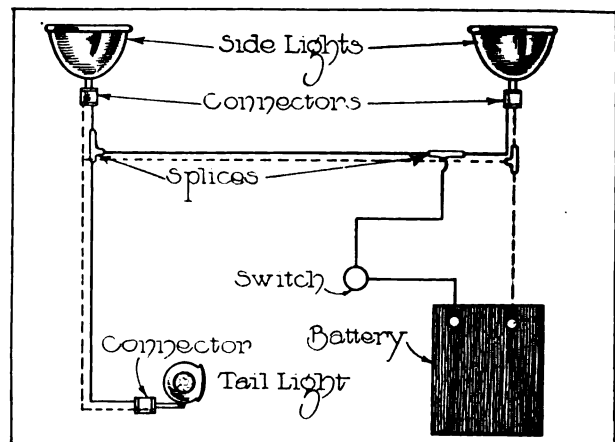


Fig. 2—Wiring Diagram of Electric Headlights with Straight Storage Battery System of Lighting.

Complete information on installing electric lighting systems is given in "Lighting the Motor Car by Electricity", published by The Auto-



ble Journal Publishing Company, the book containing over 210 illustrations and wiring diagrams.

#### Anti-Freezing Solutions.

(1676)—In reading over the table of anti-freezing solutions published in the Nov. 10 issue of The Automobile Journal, I notice that you do not state what percentage of glycerine or alcohol you use in a solution made up of water, glycerine and alcohol. You state the percentage of water, plus that of alcohol and glycerine together.

D. C. THOMAS.

Minneapolis, Minn., Nov. 18.

The anti-freezing solutions and their freezing points were described in the Oct. 25 issue of The Automobile Journal. In preparing the water, glycerine and alcohol solution, equal parts of the first two named ingredients are utilized. For example: With the mixture prepared to withstand a temperature of 23 degrees below zero Fahrenheit, 60 per cent. water is employed and 20 per cent. each of alcohol and glycerine.

#### Focal Adjustment of Bulbs.

(1677)—Enclosed find money order for renewal of my subscription to The Automobile Journal. I look forward every two weeks for your magazine with interest. I have a few questions I would like to have answered if possible.

1—Can you give me the address of a concern making a special type of piston ring? The article appeared some months ago in The Automobile Journal.

2—Could you give me the address of a concern making copper asbestos gaskets of all sizes? I would like to obtain some for the bottom of the Buick valve cages, as it is quite difficult to grind them into a perfect seat, especially the older types of Buicks, models 17, 10 and 8.

3—A party here asks me if it is possible to place a storage battery in a model T Ford car and charge it from the flywheel generator, and fit an automatic cut-out which would cut out when the battery was charged to six volts? Also is there any firm making a specialty of felt gaskets to go between the crankcases of different types of motors?

4—Do you know of any good book on motor troubles and how to correct them; that is, a book containing practical experiences of different men and what they have done to overcome carburetor, magneto and valve troubles? I have read a large number of books on automobiles but never came across one to my suiting. Probably it is not printed.

5—Relative to the electric headlights on a Cole 40: When standing and looking in the headlights they are very dazzling, yet when on the road they do not throw a strong light, as they did formerly. The bulbs were dark, so I replaced them with new ones, but it made no difference. Changed the positions and threw the light on a wall in a dark place. It looks when sitting in the car that the left hand light does all the lighting and the right none. The lamps have been lined up with each other.

C. B. F.

Portage la Prairie, Manitoba, Can., Nov. 20.

1—The piston ring referred to is the Leak-proof, marketed by the Motor Parts Company, 185 Columbus avenue, Boston, and 818 North Broad street, Philadelphia.

2—The Victor Manufacturing & Gasket Company, Troy and 21st streets, Chicago, Ill., produces a wide variety of asbestos copper gaskets.

3—A storage battery cannot be charged by the electricity generated by the flywheel gener-

ator of the model T Ford motor unless the system includes a rectifier, as the current is alternating and must be changed into a direct. Automatic cut-outs are employed to cut in the current from the generator when it attains a predetermined value, and to disconnect the dynamo when its output or energy is less than that of the cells, or, in other words, the device prevents the battery discharging through the generator. To cut out the charging apparatus when the battery is fully charged a manually operated switch is employed in the lighting systems abroad, but the writer does not know of any American system utilizing this method. A voltmeter is included with the equipments referred to.

4—The Automobile Journal Publishing Company issues a set of mechanical handbooks dealing in a practical manner with ignition, carburetion and internal combustion engines, and the data were compiled by men of experience.

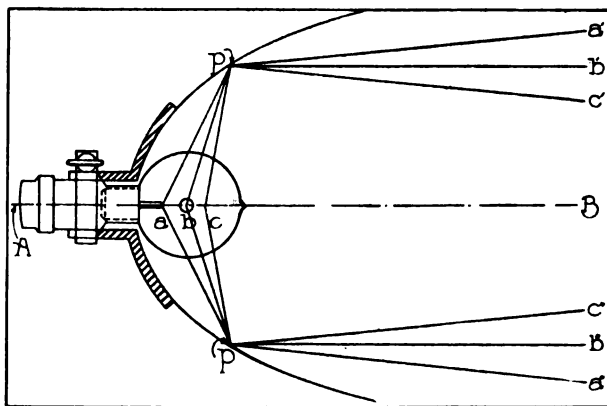


Fig. 3—Depleting the Focal Value in Parabolic Automobile Electric Headlights.

5—The lighting system employed on the Cole car is the Delco, made by the Dayton Engineering Laboratories Company, Dayton, O., and this concern will supply complete data as to the operation, maintenance and care of its product.

The headlights utilized are 21 candlepower members and have a reverse spiral filament which is stated to make for extreme penetration, as well as to give a good side light. With the use of these bulbs it should become a question of proper focal adjustment and the illustration at Fig. 3 depicts the focal value in headlights.

When one attempts to alter the distribution of light from a headlight, upon moving the bulb backward or forward along the axis of the reflector, it will be found that there is one position at which the nearest approximation to a needle or parallel sided beam is secured. If the lamp be brought nearer to the vertex of the reflector a more divergent beam is obtained, while at the



same time the field is rendered less uniform.

These diverging and parallel beams, as well as the value of focal adjustment, are shown in the illustration previously referred to, the drawing depicting a sectional view of the reflector, lamp and socket. There are three cases to be considered, namely: The filament at the successive positions, a, b and c, as denoted. Positions a and c are any two locations behind and ahead, respectively, of the geometrical focus of the deflector, and that at b is at the geometrical focus.

Assume that the centre of the filament is at a. A ray of light emanating from this point and incident upon the reflector at any point, as at P, will propagate along the line  $Pa^1$ . It will be noted that a system of rays taken through a complete revolution about this point will form a truncated cone of rays. A large amount of light will, therefore, be uselessly dissipated in the air.

In the second case to be considered, a ray of light also striking the reflector P will assume the

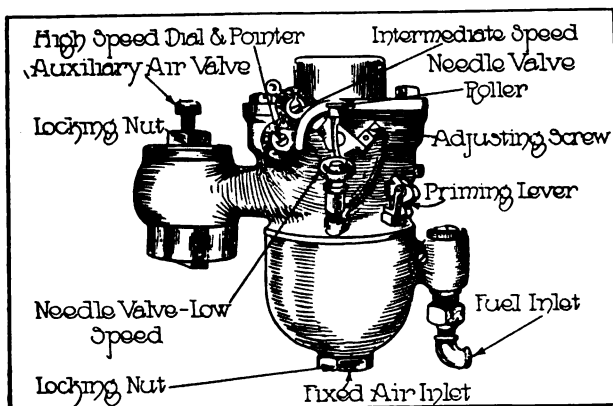


Fig. 4—Components Utilized in Adjusting Model L Schebler Carburetor.

direction  $Pb^1$ . Thus a complete series of rays will form a cylinder parallel to the major axis A B. This is held to be an ideal condition for a long concentrated projection.

Thirdly, a ray coming into contact with the reflecting surface at P will in turn follow the direction  $Pc^1$ . Concentric zones of light and dark on the illuminated plane will be the result.

From the above it will be seen that in the first case the rays are spread out and that distance projection is sacrificed for a wide display of light on the ground close to the machine. In the second instance, a long projection of light, and in the third case an undesirable collection of light and shadow due to the crossing of the rays are the results.

#### Carbon Removers.

(1678)—Kindly advise me as to a safe carbon remover which can be placed in the cylinders instead of having

to scrape the deposits, also information as to the air adjustment of a model L Schebler carburetor.  
W. R. KEELER.

Bridgeport, Conn., Dec. 3.

There are a number of carbon removers marketed and a list of makers will be found in the Classified Buyers' Guide, elsewhere in this issue.

The model L Schebler carburetor has two air intakes, one a fixed member and the other an automatic or auxiliary as shown at Fig. 4. The maker recommends adjusting the auxiliary air in such manner that the valve seats lightly; that is, a light tension of the spring retaining the valve on its seat. Regulation of the fuel is by the needle valve for low speed and by two dials for intermediate and high, respectively. If trouble be experienced with the auxiliary air valve it is suggested that it be disassembled and cleaned as it is possible that the valve stem has become dirty and sticks.

#### BOSCH AT FOREIGN SHOWS.

This Type of Ignition Well Represented at Recent Paris and London Displays.

According to the Bosch Magneto Company, New York City, of the 534 gasoline automobiles exhibited at the Olympia show, London, England, 450, or 84.27 per cent., employed the Bosch magneto for ignition purposes. The balance of 15.73 per cent. was divided among 10 other magneto manufacturers, the nearest to the Bosch having 7.6 per cent.

At the Paris Salon, where car makers applied magnetos on 483 machines shown, 393 were Bosch. This means a percentage of 81.37.

#### ADOPTS GRAY SYSTEM.

McFarlan Six First to Be Equipped with Pneumatic Gearshift.

The McFarlan Motor Company, Connorsville, Ind., has announced that its six-cylinder model will carry the Gray pneumatic gearshifting and engine starting system, made by the Research Company, Plano, Ill., as standard equipment at a slight increase in price over stock models. This marks the first formal adoption of the apparatus by any car manufacturer.

The Gray system consists of a small compressor which is driven by the engine, a compressed air reservoir and the gearshifting mechanism, which operates by selection through a quadrant on the steering wheel and plungers working in cylinders, the plungers being attached to the sliding gears.



## IMPROVED ROADS AND MOTORING LAWS.

### California Motorists to Test New Registration Provision in the Courts—Ohio Judge Declares Warnes Statute Unconstitutional—Convict Labor on Highways.

**M**OTORISTS in California, led by the Western Motor Record, which has engaged attorneys, will attack the constitutionality of the recently enacted California motoring law, scheduled to become effective Jan. 1. The papers already have been prepared and ask that the registration clause be declared unconstitutional for the following reasons:

In that it is excessive and unreasonable for the purpose for which it is intended, being out of all proportion to the actual cost of operation of the law, which the fee is supposed to pay.

In that it constitutes a double tax, inasmuch as automobiles are also subject to tax as personal property.

In that it attempts to impose a license fee upon property, instead of an occupation or profession.

In that it is really a revenue raising measure, and not primarily one of regulation.

In that it attempts to license a right common to all, instead of a privilege.

In that it unjustly and arbitrarily classifies persons and imposes burdens upon a portion of the same class not common to all.

The old California law provided for a perpetual registration fee of \$2, and the new seeks to impose a graduated fee based upon the horsepower rating. Should the petitioners be successful the court decision would not affect other portions of the statute, special provision having been made in the act as follows:

If any section, sub-section, sentence, clause or phrase of this act is for any reason held to be unconstitutional, such decision shall not affect the validity of the remaining portions of this act. The legislature hereby declares that it would have passed this act, and each section, sub-section, sentence, clause and phrase thereof, irrespective of the fact that any one or more other sections, sub-sections, sentences, clauses or phrases be declared unconstitutional.

#### OHIO LAW UNCONSTITUTIONAL.

#### Lower Court Holds It Is a Double Taxation Measure and Therefore Void.

The automobile owners in Ohio appear to have won a decided victory in the decision of Judge Kinkead of the court of common pleas, Franklin county, who holds that the registration law passed by the last legislature is unconstitutional. The case will undoubtedly go to the supreme court, but in the meantime the secretary of state is enjoined from collecting fees on the horsepower basis as provided in the statute, which was to have gone into effect Jan. 1.

Until the passage of the Warnes bill automo-

biles in Ohio were registered on a flat rate of \$5 a year. The new law sought to impose a graduated fee according to horsepower. There does not appear to have been any objection to the payment of the \$5 fee on the part of owners, but as soon as the horsepower rating was adopted, organized motorists throughout the state immediately arranged to take the matter into the courts.

Judge Kinkead finds that the law is unconstitutional because it seeks to impose a double taxation contrary to the supreme law of the commonwealth. It is now maintained by motorists that the old law is unconstitutional for the same reason, and it is not unlikely that steps will be taken to test this in the courts should there be any attempt to enforce its provisions, in lieu of those of the Warnes law.

#### PUBLIC ROAD MONEYS.

#### How the Expenditures for Highway Improvement Have Gained in Ten Years.

An interesting comparison between the expenditure on public roads in the United States in 1904 and in 1912 has just been compiled by the Department of Agriculture, through its office of public roads, showing the tremendous growth that has taken place in the movement for better highways during that period. In 1904 the total expenditure on all public roads in the United States was \$79,771,417, but in 1912 this amounted to \$164,232,365. The expenditure for each mile in 1904 was \$37.07, and in 1912, \$74.65. The expenditure for each inhabitant in 1904 was \$1.05 and in 1912, \$1.78.

The office of public roads finds that the greatest progress in road building has been made in the states which contribute from the state treasury toward the construction of state aid or trunk line highways. In 1904 there were 13 states that contributed out of the general fund \$2,607,000, but in 1912, there were 35 states contributing \$43,757,438. The states having the largest expenditures for this purpose in 1912 were: New York, \$23,000,000; Pennsylvania, \$4,000,000; Maryland, \$3,370,000; Connecticut, \$3,000,000.



### TRUCK FENDER ORDINANCE.

#### Police Commissioner in Detroit Extends Time Until First of the Year.

The new ordinance in Detroit, compelling motor driven business wagons to be equipped with some form of fender, approved by the police commission, which was to have gone into effect last month, is causing some little difficulty for Police Commissioner John Gillespie. Mr. Gillespie has discovered, what practically every truck manufacturer, owner and user already knew, that there is no such thing as a satisfactory fender of this type, and has made the following announcement:

The truck fender business is still in its infancy and no perfect type of fender has yet been developed, so I shall extend the time until Jan. 1, 1914, for the equipment of motor trucks with these safety devices.

It is probably safe to predict that Police Commissioner Gillespie will discover, before Jan. 1, that the truck fender business is no such lusty infant that it can be expected to develop a perfect type of fender within these additional two months.

### PRISON LABOR LAWS.

#### Thirteen States Have Taken Definite Action on This Plan During 1913.

Thirteen states have passed laws during the present year allowing the use of convicts in the construction and repair of highways, according to a compilation by Dr. E. Stagg Whitin, assistant in social legislation in Columbia University, and chairman of the executive committee of the National Committee on Prison Labor. They are: Arkansas, Delaware, Florida, Illinois, Indiana, Kansas, Maine, New Jersey, North Dakota, Pennsylvania, Vermont, West Virginia and Wisconsin. Several states had previously passed similar legislation, so that the number of commonwealths that have not taken favorable action is growing much smaller.

Colorado, North Dakota, Oregon, New Jersey, Michigan and Ohio are among the states where the honor system has been developed to its highest degree, according to this same authority. It was in Colorado, under Warden Thomas J. Tynan, that the honor system was first employed among prisoners at work on the highways, and it is in that state and in Oregon that the system has been most extensively utilized. In a recent statement concerning the system, Governor West of Oregon said:

Our road gangs are made up of from 15 to 25 men, with a free man as foreman, who lives and works with his crew. His word is law in camp, and his report as to conduct of the prisoners carries great weight with the prison officials. It is most essential, therefore, that great care be exercised in the selection of these foremen. We have had unexpected success in the operation of our road gangs. Some have been maintained as far as 300 miles from the prison and nearly all in the hills and mountains, where every opportunity was given to escape. At first we lost a number of men, due largely to the novelty of the plan and unjust newspaper criticism, which made many of them fear the abandonment of the policy and their return to prison. There has been less newspaper criticism of late, and the public, seeing the merits of the system, is accepting it as a settled policy.

### FIFTEEN WANT CONVENTION.

#### American Highway Association Undoubtedly Will Meet Next Year in the South.

Competition for the honor of entertaining the 1914 convention of the American Highway Association is unusually keen, judging from the report that 15 cities have made application, as follows: New York, Chicago, Kansas City, Milwaukee, Minneapolis, Detroit, St. Louis, Atlanta, Denver, Cincinnati, Peoria, Rochester, Buffalo, Louisville and New Orleans. No decision has been reached, but it is understood that the association favors a city in the southern tier of states, and that the choice will rest between three—Atlanta, Denver and New Orleans.

It will be understood that the selection of the convention city is an important matter, because of the impetus for good roads throughout the immediate territory of which the city is a commercial centre. It is for this reason that it is anticipated that some portion of the country will be honored, in which there is decided need for promotion of this character.

### ST. LOUIS' ROAD MEETING.

#### Convention of United States Good Roads Association Lacks in Attendance.

It would appear, from published reports from St. Louis, that the first annual convention of the United States Good Roads Association in that city last month, was hardly the success that had been expected. About 300 delegates were in attendance at the opening session, but this number rapidly dwindled to 14, who decided to adjourn to meet in Tulsa, Okla., in 1914.

The announcements prior to the opening of the convention indicated that the association was formed largely to support the passage of certain bills introduced in Congress for federal aid in state and local highway construction. Inasmuch as there are already two large national bodies of



good roads advocates, one committed more less to the federal aid proposition and the other to the actual building of national highways with federal funds, it is assumed that most improved highway enthusiasts feel that there is little need for another national organization of this character.

### RELOCATING HIGHWAYS.

#### Government Holds That the Longest Way Around May Be the Shortest Way Home.

In connection with its campaign of education in the matter of road building the office of roads, Department of Agriculture, Washington, D. C., is issuing a bulletin, calling attention to its position with respect to the relocation of highways. It reads in part as follows:

The doctrine of the office of roads is that the longest way around may often be the shortest and most economical way home, and that frequently by building a highway around a hill or grade, but little appreciable distance is added and this is more than offset by the reduced strain of hauling.

The chief drawback from the farm owner's point of view is that the laying out of roads on this principle of avoiding grades necessitates, in some cases, running the road through good farm land, or orchard or pastures, instead of going around the farm line and building the road through old worn-out fields and over rocky knolls. This, of course, must raise a question in the mind of the individual land owner, as to whether the cutting up of his property by a road yields him individual advantages and so benefits his community as to offset the use of such land for a road, or to overcome the inconvenience of having his land divided.

In this connection the office of roads points out that the running of a road and the resulting traffic through a good farm, where there are good sheep, cattle, horses, grain, fruit or vegetables, has a certain advertising value and in many instances makes the land more valuable. In other cases, the importance of such a level road to the community is so great that it might well repay those using the road to give the farmer the equivalent in land equally good in place of what he has sacrificed to the common welfare.

According to the testimony of farmers consulted, where a horse might be able to pull 4000 pounds on a level road, it would have difficulty in pulling 3000 pounds up a steep hill. The size of the load, therefore, tends to be measured by the grade of the largest hill on the road to market. In a number of cases actual experiment shows that the relocating of roads around hills has been accomplished, either with no addition in road length in some instances, and with the adding of only a few feet to the highway in others. The office knows of no case where a properly relocated road, which has cut out grades, has led to any question as to its material reduction of hauling costs.

### LINCOLN HIGHWAY NEWS.

According to figures just completed by Frank H. Trego, chief engineer of the Lincoln Highway Association, the Lincoln highway is 3388.6 miles long from New York to San Francisco. The half-way mark is between Lexington and Cozad, Neb.

The association has taken advantage of the opportunity afforded by the J. L. Hudson Company in Detroit to utilize one of its show windows for a special display calling attention to the Lincoln highway. At one end of the window is a view of New York and its skyscrapers, while at the other is the Golden Gate. A road runs between, on which are located automobiles, road making

apparatus, supplies, etc. It is probable that other window displays of a like character will be utilized throughout the country.

The recently organized Automobile Club of Northern California, with headquarters in Oakland, Cal., is perfecting plans for raising \$1,000,000 in that state for the Lincoln highway. The club has a membership of 300, and the directors are: Fred M. Franklin, Charles D. Heywood, William Cryer, C. L. Lamb, William E. Dean, W. S. Rymer, John Howard, A. Moffitt, E. A. Young, Hugh M. Hogan, H. S. Martin, L. Church, Grant B. Miller and H. B. Lyon.

The name of the Indiana division of the Transcontinental Highway Association has been changed to the Northern Indiana Lincoln Highway Association. The new organization includes 10 towns and cities in the northern part of the state, as follows: Ligonier, Goshen, Elkhart, Mishawaka, South Bend, New Carlisle, Rolling Prairie, Laporte, Valparaiso and Hobart.

Rather unusual conditions surround the proposed \$50,000 bond issue for Church county, Nevada, the money to be used in the improvement of its section of the Lincoln highway. The amount is to be borrowed from the state and will bear interest of five per cent. In return, the state will expend the money in the public schools of Churchill county.

### TIRE PRICE REDUCTION.

#### B. F. Goodrich Company Announces Cut on Goodrich and Diamond Products.

The B. F. Goodrich Company, Akron, O., has announced a reduction in price on its Goodrich Safety Tread and Diamond Vitalized Rubber tires. In explanation of this action, it is stated by the company that it was the first to announce a price reduction in the spring of 1912 and again in the spring of 1913. It is added that it was not thought possible that a further cut would be made before early next year, and the present decision comes somewhat as a surprise in consequence. In discussing the matter W. O. Rutherford of the general sales department says:

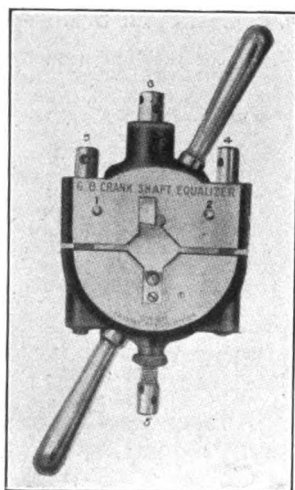
This action is characteristic of the Goodrich company's policy of maintaining its leadership. It is our policy to deserve and hold the confidence of our customers by always sharing with them the benefits derived from improved methods of manufacture and changing conditions of the rubber and other markets. At this time a lowering in the cost of tires means a lot to the user. It means a genuine help to him in reducing the expense of operating his car. The price reduction is considerable and every man who has to buy tires is going to appreciate it.

The executive committee of the automobile fire insurance conference, held recently to consider the competition of the Automobile Insurance Company, Hartford, Conn., an allied company of the Aetna Life Insurance Company, voted to allow a discount of 15 per cent. on all gasoline automobiles equipped with an "approved" fire extinguisher. This action follows an announcement by the Automobile Insurance Company, offering a similar reduction on automobiles equipped with a certain make of fire extinguisher which had been approved by the National Board of Fire Underwriters.



## GARAGE AND REPAIR SHOP EQUIPMENT.

**T**HE usual method employed for equalizing or truing up the bearings of a crankshaft is to place the work in a lathe. The G. B. Sales Corporation, 1790 Broadway, New York City, is marketing the G. B. crankshaft equalizer shown in an accompanying illustration, it being designed for truing up bearings by hand. The maker states that it will true up the bearings of a crankshaft in from three to four hours and that accurate results are obtained.



**G. B. Crankshaft Equalizer.**

If one or two bearings require attention it is stated that the work may be done without removing the crankshaft from the motor, only the displacement of the bottom of the crankcase and dropping the bottom half of the crank arm being necessary.

The operation of the tool is best explained by the directions accompanying each member: Take out the Nos. 1 and 2 pins, pull the tool apart and attach to crankshaft, then replace the pins. Screw down the adjusting screws Nos. 3 and 4, until a light but firm contact is made with the shaft. Next adjust the steel roller by the screw No. 5 until the same touches the shaft lightly. Screw down the cutting knife by the screw No. 6 to a cutting position and turn the tool slowly and steadily.

The G. B. crankshaft equalizer is constructed of high grade material throughout. The cutting blade is made of the finest quality of high speed, oil tempered tool steel, and it is stated that it will true up 25 shafts with one sharpening. It may be resharpened by the user, but the factory makes no charge for this work. The tool is made in two sizes, the No. 1 taking shafts from two to 3.5 inches, the No. 2 being designed for shafts from 1.5 to 2.5 inches.

### HEALY VALVE RESEATER.

The Healy valve reseater and dresser is manufactured by the Healy Tool & Appliance Company, Brocton, N. Y., with New York City office at 1790 Broadway, of which Ralph Waldt is man-

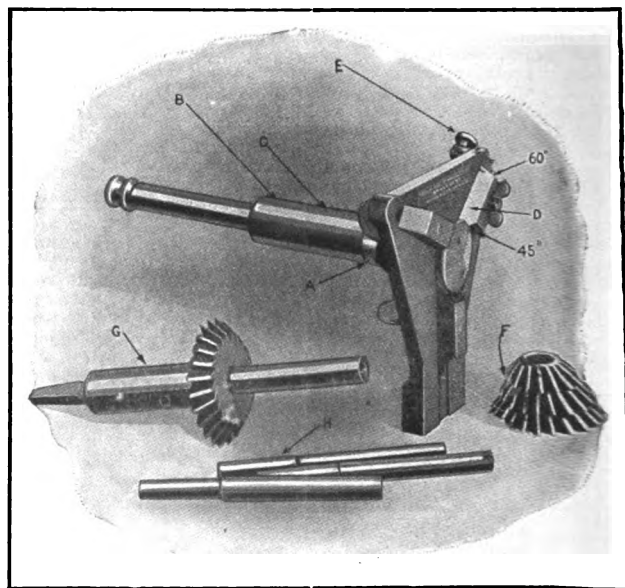
ager. The complete equipment is shown in an accompanying illustration with the components lettered.

A bearing on the valve stem is provided at A, it being in the same relative position as to seat as is the bearing in the cylinder. This bearing coming so near to the valve head eliminates chattering while the valve is being dressed. A second valve stem bearing is provided at B, it holding the stem central and rigid while a cut is being made. The adjustable bearing handle is shown at C and it may, by a few turns, be adapted to any size valve stem or worn members.

The reversible face cutter D has a 45-degree cutter at one end and a 60-degree at the other. These being adjustable, a roughing cut may be first used then a finishing cut without disturbing the adjustments.

The adjustment of the face cutter is depicted at E. It can be set to the thousandth of an inch. The seating cutter F is so shaped that it will remove all shoulders. The cutter carrier G has a taper which corresponds with that of the cutter, aligning it perfectly in the carrier. A Brown & Sharpe taper to the pilot aligns the same perfectly with the cutter as shown at H.

The tool is operated by hand; all wearing parts are of tool steel, hardened and ground to



**Healy Valve Reseater and Dresser.**

exact proportions, and the equipment comprises a dressing head complete with an extra roughing cutter, also one each of 1.625, two, 2.25 and 2.5-



inch valve seat cutters and carriers. The pilots included consist of one each of .3125, .375, .4375 and .5 inch. Labor and time saving qualities of the tool are emphasized by the maker.

### MOORE CHAIN HOIST.

The Chisholm & Moore Manufacturing Company, Cleveland, O., maker of chain hoists and trolleys, is marketing the Moore anti-friction chain hoist shown in an accompanying illustration. It is produced in capacities ranging from one-half to 10 tons and is provided with an improved automatic brake which locks the load at all points and yet permits of a very free and smooth lowering movement.

The brake is adjustable, permitting of lowering the load more freely, and all friction surfaces require no oiling as they are self-lubricating. The locking device is released by a slight reverse pull on the hand chain. The maker states that it has less working parts than any other hoist except the direct differential, and that spur gears are utilized.

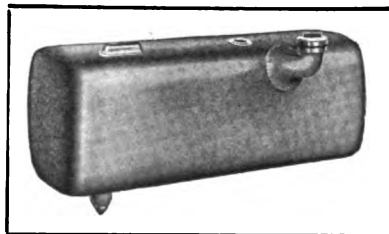
The chains are made of the highest grade material and are tested and stretched to gauge on a pull of 100 per cent. greater than the maximum load they are intended to carry. The height of lift varies from eight feet for the half-ton hoist to 12 feet for the 10-ton member. By utilizing two extra feet of both main and hand chain an additional foot of lift may be obtained. The company will forward catalogue free upon request.

### JASCO LEAKLESS TANK.

After experimenting for over a year, Janney, Steinmetz & Company, Philadelphia, has perfected a series of square dies to make a seamless, leakless, drawn, bolster shape underhung tank. The growing practise of carrying the fuel tank at the rear of the chassis and the advantages derived therefrom has led the company to produce various sizes, the most popular being 13 inches wide by 13 high and from 30 to 36 long, according to the location of the hanging straps of the chassis. The tank is also produced 12 inches high and 14 wide and in convenient

lengths to accommodate the hanging straps.

All models are supplied with standard fittings made by the company, including brass goose neck extension filler, outlet with sediment cup, up-feed tube for pressure service and gasoline indicator to show contents. The company is continuing its line of cylindrical or round tanks and in all diameters.



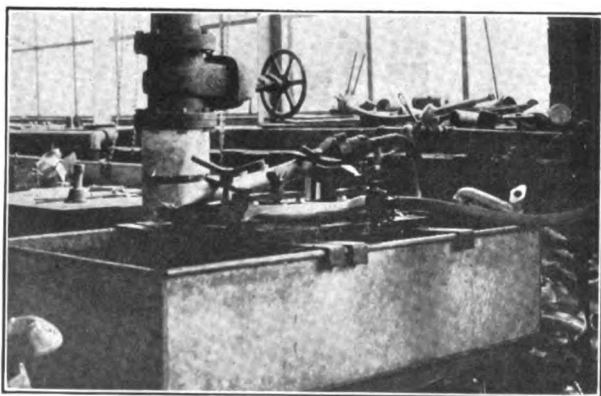
New Jasco Seamless Tank.

### TESTING WATER MANIFOLDS.

Indicative of the care exercised in the manufacture of the parts utilized in the Overland cars is the method of testing the water manifolds of the motor. An accompanying illustration shows how each cast aluminum manifold is tested before being placed on the power plant.

Each manifold is securely fastened to a level surface on which a strip of rubber has been placed to act as a gasket. The ends are connected to a large water main through which water is pumped at a pressure of 100 pounds to the square inch. When the connection is complete a valve is opened, which allows the water to rush into the manifold, making possible the detection of the smallest hole and any flaw that may exist in the casting.

It is stated that cold water under pressure will find a smaller opening than steam or liquid,



How Water Manifolds of Overland Car Are Tested for Imperfections.

and that the method is utilized in testing locomotive, steamship and stationary boilers carrying 100 to 200 pounds pressure.



## THE REPAIR SHOP AND GARAGE.

### Adjustable Trammel for Quickly Testing Alignment of Wheels—Suggestion for Enlarging Capacity of Lathe Chuck by Fitting Jaws—Easily Made Drilling Block.

**A** DESIGN for testing the alignment of road wheels, which is adjustable, is shown at Fig. 1 and it will be of value in the service sta-

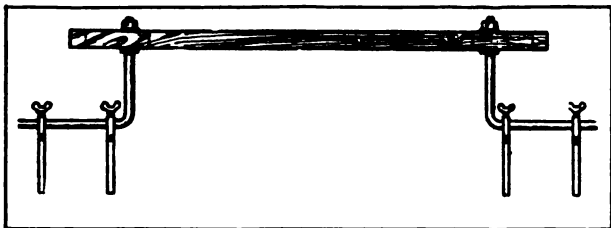


Fig. 1—Trammel for Testing Alignment of Wheels Quickly and Adjustable to Any Chassis.

tion and where a number of cars are to be inspected for suspected misalignment. The inventor of the device was awarded the weekly prize by the Commercial Motor, an English publication. The method of application is to place one of the front wheels parallel with the chassis, which is done by measuring from the inside rim of the wheel to the outside edge of the spring, then slip the trammel over the wheels about the height of the hubs. If the trammel will not go on both sides of the wheels, it can be ascertained how much they are out of line.

To test the lock of the front wheels, the steering wheel is placed to the maximum right hand position and a measurement taken from the inside edge of the left hand road wheel to the chassis, then the lock is put over on the opposite direction and the left wheel is measured again in the same way. If the two dimensions do not correspond, it is evident there is misalignment.

The construction of the trammel should not be expensive as the material could be procured

from the scrap heap and the parts could be assembled easily.

#### DRILLING HARD STEEL.

Hard steel may be drilled more readily by using turpentine instead of oil. The drill will cut when it would not touch the work with oil.

#### EASILY MADE DRILLING BLOCK.

Some types of work, such as light U shaped members, are not easily drilled. At Fig. 3 is presented a method of utilizing a section of an old crankshaft for making a drilling block. The cheeks are planed smooth and parallel, thus making this portion of the shaft particularly suitable for the purpose. The journals are sawed off so that each cheek can be utilized on the table of the drilling machine. The remaining members can be cut up and employed on a shaping machine for packing strips.

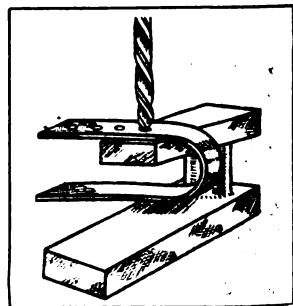


Fig. 3—Drilling Block Made from Crankshaft.

The block as shown is specially suited for drilling light bent work and the raised portion enables the bent part of the work to clear during the operation of drilling. A spring clip is best adapted for clamping the block onto the machine table.

#### INCREASING CHUCK CAPACITY.

Small shops are sometimes called upon to do machine work which requires a larger chuck than that with which the lathe is equipped. At Fig. 2 is presented a suggestion for increasing the capacity of the chuck. It will be noted that to increase its radius, four extra blocks are machined and rectangular holes provided to enable them to be fitted over the standard jaws. It is stated that with a lathe having a capacity of 10 inches the additional jaws will permit of work up to 14 inches being turned.

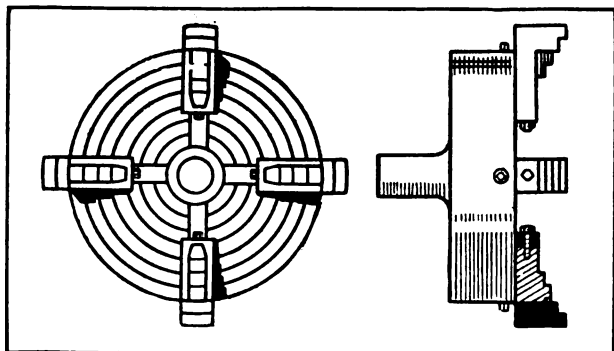


Fig. 2—Suggestion for Enlarging Capacity of Lathe Chuck by Fitting Additional Jaws.



## IN THE COMMERCIAL VEHICLE FIELD.

**Some Innovations in the B. A. Gramm Line Produced by the Gramm-Bernstein Company—Knox-Martin Tractor in Difficult Places—Fire and Police Wagons.**

**A** NNOUNCEMENT is made by the Gramm-Bernstein Company, Lima, O., that the B. A. Gramm's trucks made by it will be produced in four sizes for the 1914 season. These will be with capacities of one, two, 3.5 and five tons. The two and 3.5-ton vehicles have been manufactured for the past year and will be continued with several changes. The one-ton chassis was first announced a few months ago and will be built without change. The five-ton machine is new, and constructional details have not yet been made public.

The most distinctive change has been made in the starting equipment, this having been a feature of the B. A. Gramm design from the first. The original starting mechanism was mounted on the engine case, and the motor was started by coupling it with the flywheel. After careful observation and experiment it has been decided to install the electric starting motor and the generator on the cover of the transmission gearset. No sliding gears are used in the mounting, all the gears being permanently in mesh. The generator is driven by silent chain. The cover of the case forms a housing that protects the motor and generator, and it is very accessible. Provision is made so that the starter gear and any one of the transmission dogs cannot be engaged at the same time.

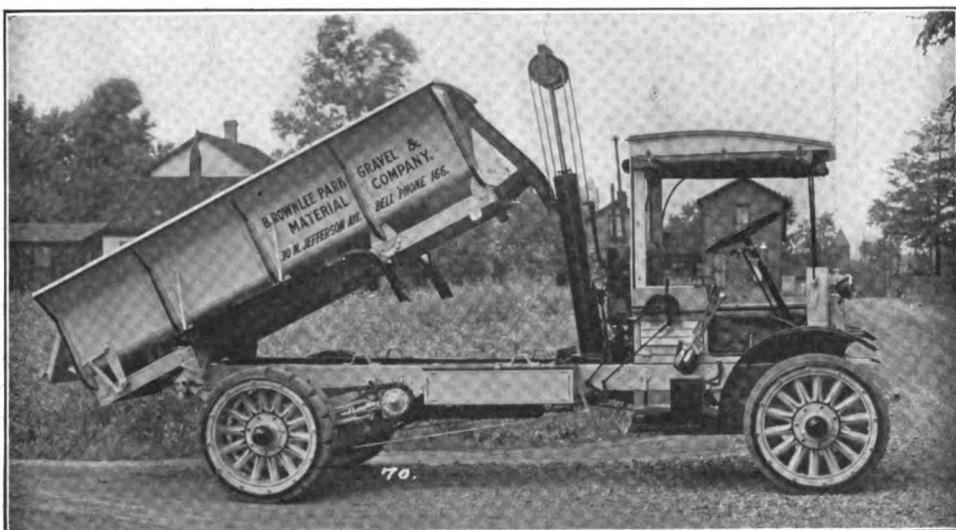
The company is also producing a dumping body, designed so that it may be fitted to the two, 3.5 and five-ton models. An accompanying illustration shows the first of these, which was delivered to the Brownlee Park Gravel & Material Company, Battle Creek, Mich., and which is said to have been entirely practical in service. The body is of steel and has a capacity of three cubic yards. It is mounted on two heavy bearings at

the rear of the chassis, and the forward end is elevated by an hydraulic hoist driven off the main shaft. By this hoist the body may be raised to an elevation of 37 degrees and can be raised and lowered in 25 seconds. The hoisting mechanism is operated by driver without leaving the seat.

### KNOX-MARTIN TRACTOR.

**An Interesting Illustration of Its Adaptability in Difficult Places.**

One of the strong points claimed for the Knox-Martin tractor, made by the Knox Auto-

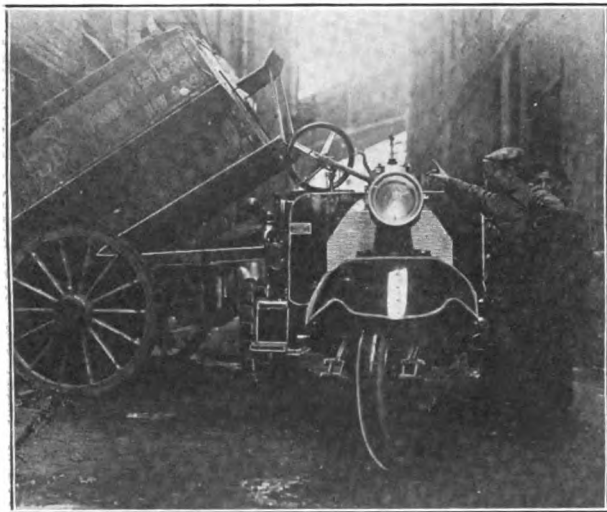


**B. A. Gramm's 3.5-Ton Truck Chassis Equipped with Hydraulic Hoist Dumping Body.**

mobile Company, Springfield, Mass., is its versatility. Coupled with this is its flexibility. In fact, it is maintained by the inventor, Charles H. Martin, that it is capable of supplanting the horse in every respect. Perhaps it were better to state that it is capable of supplanting a number of horses, for, of course, this is true when the pulling ability and speed of the tractor are taken into consideration.

An accompanying illustration calls special attention to the ability of the tractor to operate in difficult places. The machine has been found unusually well adapted to the hauling of coal, from the fact that one body may be loaded in the yards while the tractor is absent with an-





**Knox-Martin Tractor Backed into Difficult Place.**

other. In the case illustrated, it was found necessary to back the load of coal into a narrow alley, and it is stated that this feat was accomplished quite as easily in every respect as with horses.

### **FEDERAL FIRE WAGON.**

**A Body Design Which Has Met with Decided Favor During the Past Season.**

The Federal Motor Truck Company, Detroit, maker of Federal truck, is calling special attention at this time to its combination chemical engine and hose wagon, a body installation which has received decided approval in various sections of the country. The first Federal vehicles of this type were produced about a year ago, and their popularity has been such as to win a large measure of success for the company in this field.

The capacity of the chassis is one ton, and the wheelbase is 144 inches. The engine is rated at 30 horsepower and the maximum speed of the wagon is placed at 22 miles an hour. Control is at the left side.

Brass clutch rails extend the full length of the body to the rear step-board, on which are two spindles for

hose nozzles. The equipment includes: One thousand feet of standard fire hose, 35-gallon chemical tank with connection for hose from the hydrant, two five-gallon hand extinguishers in brass receptacles, hose basket suspended over the front of the body with capacity of 250 feet of chemical hose, two 20 to 25-foot extension ladders, poles, hooks and many other implements necessary for fire fighting.

### **EMPLOYS TRAILERS.**

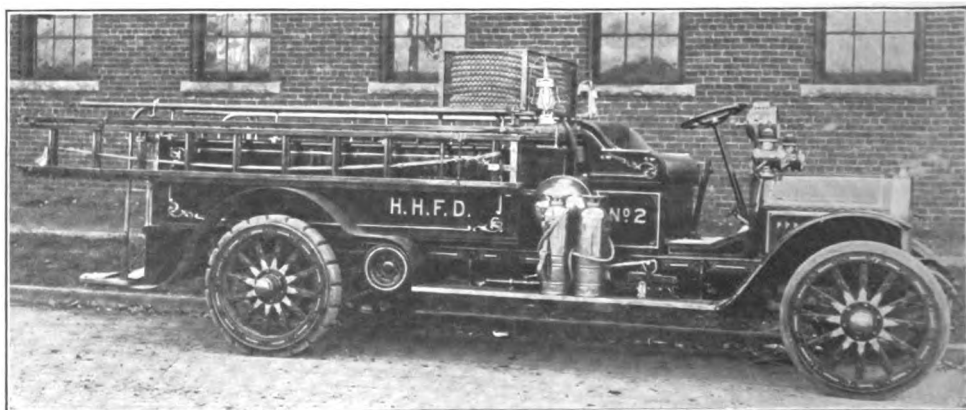
**New Orleans Postmaster Develops Parcel Post Distribution Service by Auxiliary Vehicles.**

The New Orleans postmaster has developed his parcel post distribution service by using trailers with the motor wagons available for this work. The requirements were such that the motor equipment was inadequate and so that there might be no diminution of the delivery animal wagons were fitted with axles built for motor vehicles, and street car drawheads for coupling them to the machines. The trailers have been found to draw easily and the loads can be largely increased, the motor wagons having sufficient power to take them wherever needed and with practically no loss of time.

### **WHITE PATROLS IN SERVICE.**

**Stability and Efficiency of Worcester Equipment Is Satisfactorily Demonstrated.**

In October, 1911, the police department in Worcester, Mass., placed in service one combination patrol wagon and ambulance and a vehicle equipped exclusively for ambulance work. About a month later another combination machine was added. All three chassis were of the White make,



**Federal One-Ton Chassis with Combination Chemical and Hose Wagon Equipment.**



produced by the White Company, Cleveland, O. The stability and efficiency of these three machines has been so well demonstrated during the past two years that a fourth has now been purchased and will be installed shortly.

During the two years which the three machines have been in service they have answered an aggregate of 18,728 calls, and have covered 43,455 miles. As ambulances the wagons are expected to go anywhere, and several instances are on record in which they have been called upon to traverse places that an ordinary motor car driver would consider impossible. Trips have been made through fields and wood lots, and often the way has been strewn with rocks or the mud has been hub deep.

All three machines have been in constant service, with the exception of two or three days, when overhaul work has been deemed advisable. Each is in good running condition, Chief Mathews being of the opinion that they are practically as serviceable in every way as when they left the factory. The expense for repairs has been so small as to almost negligible.

Aside from the economy afforded, as compared with horse equipment, the people of Worcester have had many examples of the value of the ambulance feature, in the numerous quick runs which have oftentimes resulted in the saving of human life.

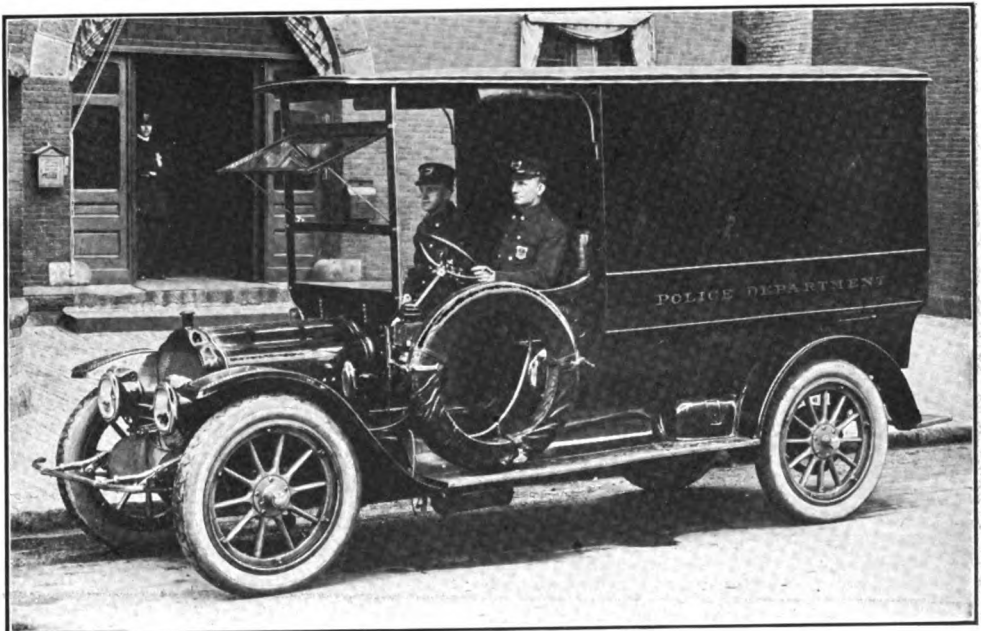
This has been particularly true in a number of cases of asphyxiation and drowning, where the pulmotor has been rushed to the scene without loss of time. There also are hundreds of instances in which people have been wounded and have been saved from serious results through the ability of the police department to make rapid time in reaching the hospital or medical attention. Surgeons in charge of these patients state that many of them would have died had they been compelled to wait for a horse drawn ambulance.

## "SAFETY FIRST" BATTALION.

### Factory Foremen in Goodyear Tire Plant Organize to Protect Workmen.

A "Safety First" battalion of 115 factory foremen was organized at a recent banquet, presided over by President F. A. Seiberling of the Goodyear Tire & Rubber Company, Akron, O. The meeting was addressed by a number of "safety first" experts. A squad of men will patrol the 41-acre factory constantly, looking for dangerous operations, instructing workmen and suggesting safety devices. In introducing the subject President Seiberling said as follows:

During the past year 8000 men have worked for Goodyear. During the coming year this number will be in-



White Patrol Wagon, Which Has Seen Two Years' Service in Worcester, Mass.

creased to 10,000. It is inevitable among such a multitude that accidents will happen. Goodyear foremen need to realize the necessity of safeguards and constant vigilance. This company holds the safeguarding of the lives and well being of its employees as a high moral obligation.

The Kalamazoo Automobile Dealers' Association has been formed by a number of the dealers of Kalamazoo, Mich., for the purpose of taking charge of the annual automobile show in that city, which will be held Feb. 3-7 at the state armory. In the past the show has been conducted by some fraternal association. This season it is planned to display 90 pleasure cars in addition to a number of commercial cars, motorcycles, cyclecars and there will also be a representative showing of accessories and supplies.



## MECHANICAL NOTES FOR OWNERS.

### Increasing Temperature of Water Jacketed Carburetors---Causes of Hard Starting and Suggested Remedies---Priming the Intake Manifold---Testing the Ammeter.

**T**HE motorist who has purchased his first car since last winter may be somewhat discouraged to find in cold weather that it is not only difficult to start the motor, but it does not pull as well as it did in the warm weather, especially during the first 10 miles of a run. The reason is that in cold weather the fuel does not vaporize as readily as when the temperature is warm, and it may be necessary to heat the carburetor or the incoming air to secure more efficient carburetion.

If the carburetor is water jacketed the water may never in cold weather reach such a temperature as will materially improve vaporization. That is to say, the radiator and fan in combin-

them may be impeded to a considerable degree.

If the water supplied to the jackets of the carburetor is too cool, and removing the fan belt does not afford the desired temperature, the suggestion made at Fig. 1 will improve conditions. It will be noted that instead of the usual pipe leading directly from the cylinder jacket to the carburetor it is coiled around the exhaust pipe or manifold. This arrangement does not involve any alterations in the fittings to the water jackets, requiring merely a sufficient length of annealed copper tubing to wind it around the exhaust pipe. The number of coils to be used will depend upon conditions and can be determined by experimentation.

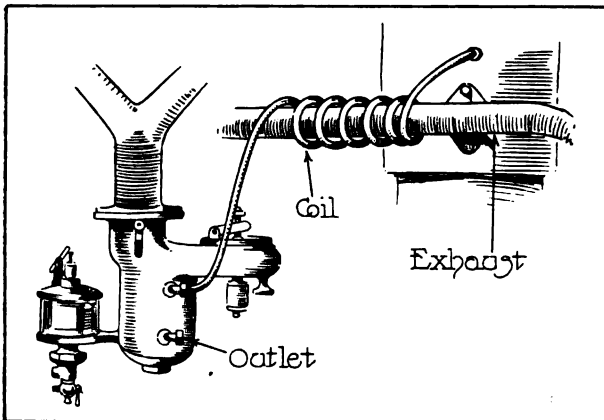


Fig. 1—Increasing the Temperature of a Water Jacketed Carburetor by Coiling Tube Around Exhaust Pipe.

ation may reduce the water to a degree where it will not heat the carburetor. It is obvious that a motor that will not heat in hot weather will be even cooler in operation in winter, and this condition not only prevents thorough vaporization of the fuel, but the engine is kept so cold that its full efficiency is not realized. On many cars the temperature of the cooling system may be raised by removing or slackening the fan drive.

When the carburetor is heated from the exhaust and the heat is not sufficient for good carburetion, it is advisable to remove the inlet and outlet pipes to the carburetor jacket and ascertain whether they and the jacket are unobstructed. These pipes and the exhaust jacket of the carburetor may become partially clogged, especially if considerable lubricant is fed to the motor, so that passage of the exhaust gases through

#### PRIMING THE CARBURETOR.

When the motor is fitted with petcocks it is a simple matter to prime the cylinders for starting in low temperatures. There are, however, many old models which are without these fittings and to prime the motor it is necessary to remove the spark plugs to introduce the fluid.

At Fig. 2 is shown a suggestion made by a reader who states that he has obtained excellent results and that the work may be performed easily and at a slight expense. The drawing clearly shows the principle employed, which is that of supplying gasoline or a priming fluid to the float chamber of the carburetor.

The container or tank may be of any desired size, but in the installation made one of a quart capacity was used. It was secured to the dash under the hood by clamps soldered on, these being drilled to take screws.

A hole was drilled and tapped in the float chamber of the carburetor as shown and an .125-inch elbow coupling fitted. Incorporated in the line was a petcock for controlling the supply and which was turned on when priming of the carburetor was desired. The contributor states that he filled the dash tank with high test gasoline, and in starting the motor when cold, flooded the float chamber with this fuel. Ordinary gasoline could be used and its vaporizing point increased by the addition of ether.

At Fig. 3 is shown another application of the auxiliary dash fuel container. In this instance the supply pipe is led to the intake manifold



above the carburetor. The intake pipe is drilled and tapped to take a connector and a petcock incorporated in the line. With this design the

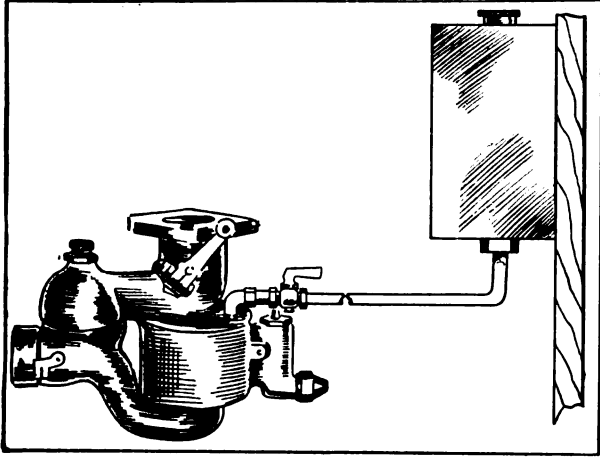


Fig. 2—Suggestion of a Reader for Introducing Priming Fluid to the Float Chamber of Carburetor.

walls of the intake pipe are flooded with fuel, creating a rich mixture, which should facilitate starting when the motor is cold. With either arrangement the necessary fittings are inexpensive and can be obtained at any supply house.

### CAUSES OF HARD STARTING.

Motorists who have experimented with the carburetor in warm weather to cut down the supply of fuel to the very lowest limit to obtain economy, are likely to experience more or less difficulty in starting the motor when cold. Too rare a mixture is usually indicated by backfiring, denoting too much air, and generally this symptom disappears upon the engine becoming warm.

To insure easier starting the supply on the low speed should be increased, that is, the mixture be enriched, and with many types of carburetors this may be done without necessarily altering the proportions of air and fuel at higher ratios.

When the carburetor is fitted with a starting valve, the supply of air can be restricted until the motor warms, but unless the valve is controlled from the seat it will be necessary to hold it closed. Generally this may be done by a control wire at the front of the car.

As a good spark is necessary for starting, attention should be given the batteries. With the large number of dual systems of ignition, the average motorist is apt to neglect the dry cells that are the source of current for starting. These should be tested from time to time, and any that

are weak replaced with new. When storage batteries are used readings should be taken of each cell with a hydrometer to learn the specific gravity of the electrolyte. The gravity of the solution in cells fully charged is 1.275 to 1.300, but if 1.150 or less the cells are completely discharged and they should be recharged.

While the better method of testing cells is the indication of a hydrometer, a voltmeter may be used. Each cell should be tested separately and should the reading be 1.8 volts or less, the battery should be recharged. It should be remembered that the efficiency of any storage battery decreases with the fall in temperature and it is only about 50 per cent. efficient at zero temperature. For this reason it is advisable to take frequent readings and to keep the cells charged in cold weather.

### TESTING THE AMMETER.

In its booklet on "Electric Lighting Systems for Automobiles" the Electric Auto-Lite Company, Toledo, O., gives some interesting information on the use of the ammeter, which is employed to indicate at all times the amount of current being produced by the generator or being discharged from the battery. The instructions are as follows: Always note the position of the index hand of the ammeter when the car is stopped. With the motor not operating and no lamps burning, the hand should point at zero. If it does not, one of two conditions exists, either the ammeter is out of calibration or there is a leakage of current from the battery at some point in the wiring, which should be corrected.

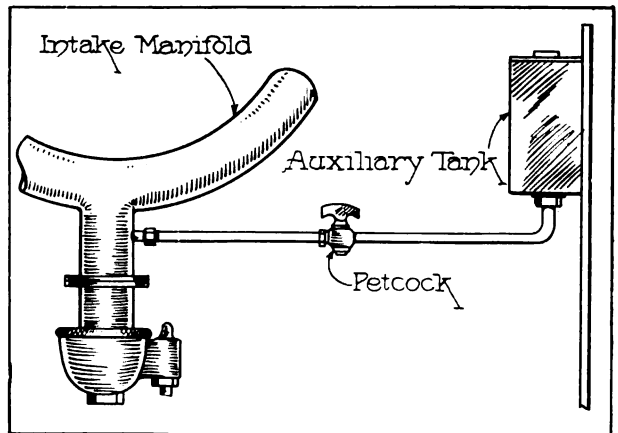


Fig. 3—Priming an Intake Manifold from an Auxiliary Tank Installed on Dash.

To determine if the ammeter is correct, disconnect one of the battery terminals of the lighting system. If the hand swings to zero the



trouble is leakage of current, which should be immediately located and corrected. If the ammeter index hand does not point to zero with one battery terminal disconnected, the instrument is out of calibration. This in no way affects the operation of the system but must, of course, be taken into account when reading the ammeter.

If the engine backfires when stopping and makes one or more revolutions in the reverse direction, the ammeter needle may be found pointing to the extreme left hand side of the scale. This is caused by the circuit breaker contacts being held closed, and means a dead short circuit of the battery through the generator. This must be corrected at once by momentarily disconnecting one of the wires at the generator or cranking the engine.

One of the terminals on the generator is marked positive + and the other negative —. If the wires to the generator are disconnected for any reason, make certain when again connected that they are attached exactly as they were originally. Should the wires be reversed the ammeter will show a dead short circuit by swinging to the extreme left when the motor is started, and if allowed to remain in this condition a discharged battery will result.

The ammeter should be wired so as to read the generator charge into the battery when the index hand is pointing to the right, and a discharge from the battery to the lamps when the hand is pointing to the left. If the indication is in the opposite direction it may be corrected by simply reversing the two wires connected to the terminals of the ammeter.

### MOLINE-KNIGHT NEWS.

#### Some Interesting Information Concerning the Latest Knight Engined Car.

The Moline Automobile Company, East Moline, Ill., which announced its first Knight engined model last month, has decided upon a new trade mark. The new name plate comprises a harmonizing combination of gold and royal blue coloring—the color scheme of King Arthur's knights—and the famous painting of Sir Galahad is depicted in the centre upon a shield shaped medallion in gold. On one side of Sir Galahad is the name Moline and on the other Knight, printed in white on a background of blue enamel.

Beginning Dec. 19, and continuing for two weeks, night and day, one of these 50 horsepower Moline-Knight motors will be placed on test in the laboratory of the Automobile Club of Amer-

ica in New York City. The club will have absolute charge of the test, and the officials of the Moline company will have nothing whatever to do with it. President W. H. Van Dervoort has such implicit faith in the reliability of the new engine that he readily consented to this practical demonstration of its efficiency.

The adoption of the Knight engine by this company, which has won chief honors in Glidden tours and racing events throughout the country, and which has been a successful producer of poppet valve engines for the past nine years, is a matter for some little comment in the industry. President Van Dervoort explains the action of the company, in part, as follows:

Following our Moline-Knight announcement scores of letters have come to us from engineers, technical students and laymen, asking the "reason why" we adopted the Knight sleeve valve type of motor after nine years' success with the old poppet valve type. In a nutshell, the answer is: "The Knight motor represents progression". Every dealer and motor car owner is candid in admitting that the Knight design is more silent than any other type of motor, but the story of its unusual power, economy and flexibility has not half been told.

The superiority of the sleeve engine over the poppet valve lies in the fact that the efficiency and durability of the sleeve valve system is not affected by high pressures. The sleeve valve is balanced against lateral pressure, and the explosion does not affect or shock it at any point. The ports are large, the inlet and outlet most effective for their area, and the action of the motor is not affected adversely by their increased size. Increase in compression up to the preignition point is no disadvantage, because the explosive pressures developed are expended in useful work upon the piston and the valves are no more difficult to open under high pressure than low, because they slide without resistance past their port openings, instead of being made to lift against pressure.

In the sleeve valve, therefore, it is possible to combine the advantages of both types of poppet valve motors. In the sleeve valve is combined the silence, endurance and reliability of the small poppet valves and low compression, with the high efficiency of the high compression, large valves, powerful springs and precipitous cams of the racing poppet valve motor, and the operator has in the one sleeve valve all the advantages of both types.

A standard sleeve valve motor is capable, so far as efficiency is concerned, of delivering all the power of the racer with all the softness and quietness of the inefficient poppet valve motor, and the operator has within his control a surplus of power which he can call into service when needed in emergencies. Of course, with standard bodies, wind resistance and weights of touring cars, nobody expects extreme racing speeds upon country roads, but the power is there when required for acceleration and hill work, as thousands of owners testify.

The H. K. McCann Company announces the resignation of Fred M. Randall, who has been associated with Gleeson Murphy in the management of its Detroit office. Mr. Murphy will continue with the company as manager of its advertising business in that city.

Tacoma, Wash., is said to be interested in the construction of a speedway, following closely the plans utilized in the speedway at Indianapolis.



## TWO BUICKS HEAD SCORE.

### A Six and a Four Not Penalized in 500-Mile New York Reliability Run.

Two Buicks, one a four and the other a six-cylinder, completed the 500-mile reliability run that took place under the auspices of the Motor Dealers' Contest Association of New York on Dec. 3, 4 and 5, with clean scores. The Chandler six was third, with the penalization of one point for a leak in the stuffing box of the water pump. Fourth place went to the Buick No. 2, which lost five points, and No. 5 was a Hudson car, which was penalized because of a broken lamp bulb. No. 6 was the Oakland, that lost 14 points. The De Dion-Bouton led the National by one point. The latter was demerited for a blowout, for running over the mark in the brake test and a faulty dash light.

The conditions of the test were very severe, penalties being imposed for damaged or inoperative accessories, tire troubles, etc. The operative tests included trials of the motor, clutch, gearset and brake. At the completion of the run the machines were subjected to a final technical examination. The equipment was inspected before and after the run.

## ATTRACTIVE PUBLICITY.

### Advertising Manager L. M. Bradley Evolves Striking Design in Blue and Gold.

One of the most attractive displays of advertising appearing in current publications is the four-page advertisement of the Moline-Knight, made by the Moline Automobile Company, East Moline, Ill. It is the creation of L. M. Bradley, advertising manager of the company, and attracted unusual attention in the automobile industry. The announcement was printed in blue and gold, as was the trade mark, which is described elsewhere in this issue.

## FORTUNE IN BLUE PRINTS.

### Maxwell Motor Car Company Has Collection at Newcastle Plant Valued at \$1,000,000.

The Maxwell Motor Company, Detroit, is building a special fireproof vault at its Newcastle, Ind., plant to safeguard a collection of blue prints which is valued at over a million dollars. The drawings are of parts of models now obsolete, but in service on old cars, and are employed in filling replacement orders every day. The

blue prints have been collected from various plants and many of them are of machines manufactured by the former United States Motor Company.

The vault is larger than those utilized by banks, being 20 feet deep and 32 long. Until the work is completed a special watchman guards the drawings during the day and another at night. The Maxwell Motor Company decided to build the vault after the loss sustained in the Dayton flood, during which practically all of the Stoddard-Dayton car patterns were ruined. Fortunately the drawings were preserved, enabling the company to get out new patterns.

Apropos of the flood, Walter E. Flanders, president of the Maxwell Motor Company, states that it will make a difference of at least 2000 cars in the season's output, as the new model 35 was being built when the flood took place.

## TAIL LIGHT DETECTOR.

### Boston Dash Device Shows a Red Light When Rear Light Is Extinguished.

In some cities the ordinances governing the use of tail lights are strictly enforced and excuses are not accepted when the lamp is extinguished. The Harding Specialties Company, Inc., 755 Boylston street, Boston, is manufacturing the Boston tail light detector, which is a neat, compact device for mounting on the dash in plain view of the driver. The signal is equipped with a red eye, which warns the operator when the tail light goes out. The Boston tail light detector is installed easily and provision is made for connecting up the speedometer or dash light if desired. The light differs from conventional designs as series wiring is eliminated by the use of special lamps. The detector is made with a heavy brass covering and the standard finishes are black-nickel, brass, oxydized-black and nickel. Other finishes are supplied at a slight extra cost.

Practically all of the automobile dealers of St. Joseph, Mich., are members of the newly incorporated St. Joseph Automobile Show Association. This organization was formed for the purpose of conducting an annual show in St. Joseph and its first exhibit will be held Feb. 4-7.

H. Rodakowsky, designer of the famous Brooklands track in England, is now in this country and is making his headquarters in New York City. He is investigating the possibilities of a motor speedway near Trenton, N. J.



## IN THE REALM OF THE MOTORCYCLIST.

### Twelve Manufacturers to Make Display at New York Show---F. A. M. Would Co-Operate with Cyclecar Interests---General News of the Maker and the Rider.

ONLY 12 makers of motorcycles will be represented at the annual New York motorcycle show this year, according to the advance announcement made by the show committee. The event will be held in the new Grand Central Palace, no part of the exhibit being in Madison Square Garden this year. As was the case last January, the motorcycles will be displayed on the fourth floor. The manufacturers who have already secured space are:

Aurora Automatic Machinery Company, Aurora, Ill.; Thor; Consolidated Manufacturing Company, Toledo, O.; Yale; Davis Sewing Machine Company, Dayton, O.; Dayton; Emblem Manufacturing Company, Angola, N. Y.; Emblem; Excelsior Motor Manufacturing & Supply Company, Chicago; Excelsior; Harley-Davidson Motor Company, Milwaukee, Wis.; Harley-Davidson; Hendee Manufacturing Company, Springfield, Mass.; Indian; Miami Cy-

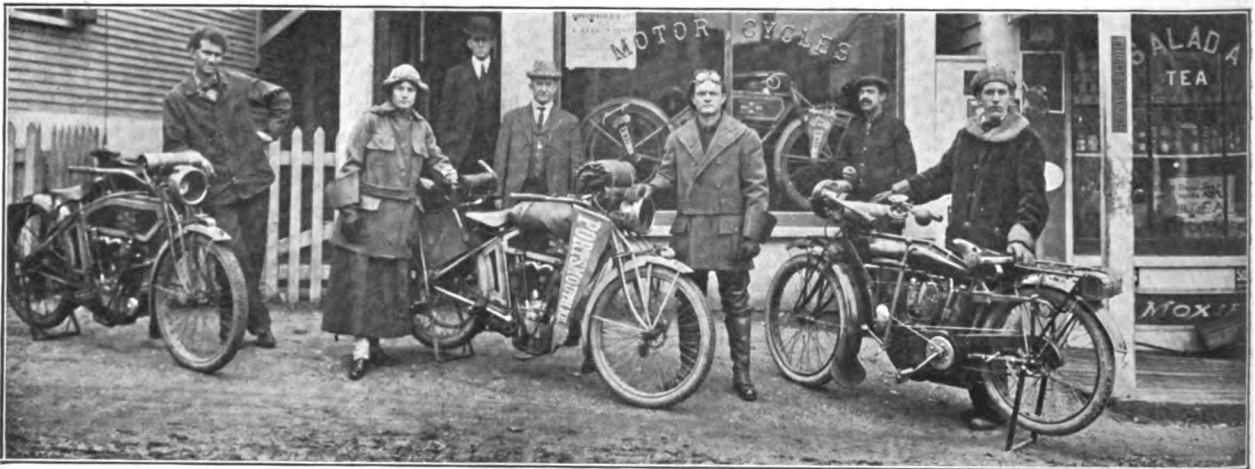
now located in Portland, Me., and received a three months' furlough in which to make the double transcontinental trip.

#### Breed to Discontinue Production.

The Breed Manufacturing Company, Bay City, Mich., maker of the Breed motorcycle, has filed a petition for dissolution in the United States circuit court of northern Michigan.

#### Recognizes the Cyclecar.

As a result of a discussion concerning the matter at the recent meeting of the board of directors of the Federation of American Motorcyclists in Chicago, steps have been taken to recognize the cyclecar by that body. The federation invites a union with the cyclecar interests, characterizing the new type of vehicle as



Mr. and Mrs. F. J. Taylor and Their Pennsylvania Tired Excelsior Tandem, at C. A. Lowd's Motorcycle Agency in Portsmouth, N. H.

cle & Manufacturing Company, Middletown, O.; Flying Merkel; Pope Manufacturing Company, Hartford, Conn.; Pope; Reading Standard Company, Reading, Penn.; R-S; Schickel Motor Company, Stamford, Conn.; Schickel; Henderson Motorcycle Company, Detroit, Henderson.

#### Transcontinental Honeymoon Trip.

Mr. and Mrs. F. J. Taylor left Portland, Me., Oct. 20, for a honeymoon trip to Portland, Ore., and return, riding an Excelsior mount with tandem attachment, and equipped with Pennsylvania Vacuum Cup motorcycle tires, made by the Pennsylvania Rubber Company, Jeannette, Penn. The machine was fitted for its long journey by C. A. Lowd, Pennsylvania tire agent in Portsmouth, N. H., where Mr. Taylor was stationed, until recently, with the navy yard. He is

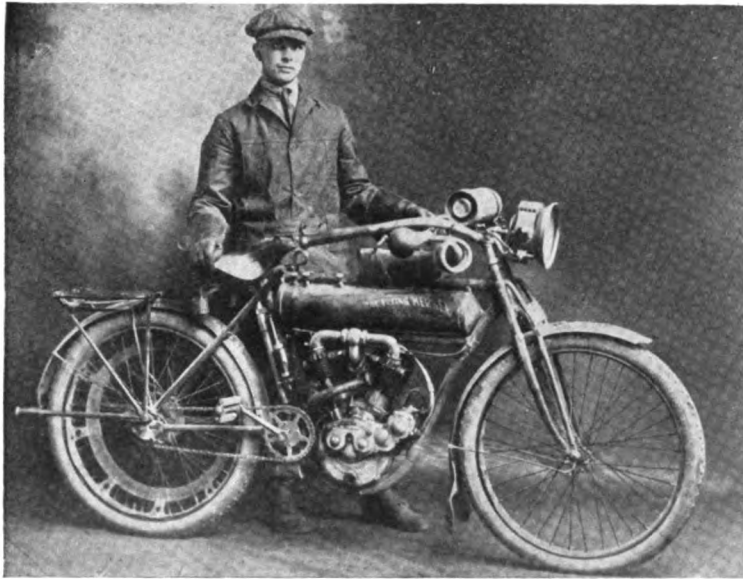
an evidence of the progress and development in motorcycle matters. The board cordially suggests co-operation in regard to membership and competition with any and all cyclecar interests.

#### Motorcycles in National Parks.

Motorcyclists throughout the country will be interested in learning from California that the recent order of the Secretary of the Interior has been interpreted to mean that motorcycles are to be excluded from the Yosemite national park, although automobiles are to be admitted under certain restrictions. The following resolution is self-explanatory:

Whereas, it has come to the notice of this board that the Department of the Interior prohibits the use of mo-





**8,400 Miles---Two Years' Service---\$1.60 Repair Expense!**

You can get the same service by riding the same motorcycle.



Middletown, Ohio, Oct. 30, 1913.

The Miami Cycle & Mfg. Co.,  
Middletown, Ohio.

Gentlemen:—I live in the country and bought a Flying Merkel two years ago to take me from the rolling mill where I work. I have also made a lot of long trips. I have always kept careful track of the amount I had to pay out for repairs and it was only \$1.60 all this time. I made 8,460 miles altogether. Mr. Clark, the Merkel agent, knows this is so. I am going to get a 1914 Self-Starting Yellow Jacket Model.

Yours respectfully,  
(Signed) BENJ. FINKBONE.

The best motorcycle in the world is better than ever for 1914. Its equipment includes the Merkel Ever-Ready Self-Starter, Spring Frame and Fork, F & S Annular Ball Bearings, the Musselman Automatic Coaster Brake and a host of other features. Write today for 1914 catalog and Free Demonstration Coupon. And remember—

*"If it passes you; it's a Flying Merkel!"*

**The Miami Cycle & Manufacturing Co.**

320 Hanover Street

Middletown, Ohio

NEW ENGLAND BRANCH, 315 DWIGHT STREET, SPRINGFIELD, MASS.

When Writing to Advertisers, Please Mention The Automobile Journal.





**Edward Seibel of Cleveland, O., and His 1914 Flying Merkel Mount.**

motorcycles in the Yosemite national park, while admitting other motor vehicles, and this discrimination is made without apparent reason, be it

Resolved, by the national board of directors of the Federation of American Motorcyclists, duly assembled in regular session, that the secretary of the interior is hereby earnestly requested to revise the regulations before the opening of the touring season of 1914, granting to motorcyclists the same rights and privileges that are accorded to automobilists.

#### **With 1914 Merkel.**

Edward Seibel, who is shown in an accompanying illustration, recently made a trip from Cleveland, O., to Florida on a 1914 Flying Merkel, made by the Miami Cycle & Manufacturing Company, Middletown, O. He reports that the new Merkel was built to pull through sand and up rocky roads that other motorcycles could not begin to negotiate.

#### **Encircled the United States.**

One of the most interesting motorcycle trips taken this summer was that of Mr. and Mrs. Charles W. Bratton, Princeton, Ill., they having practically encircled the United States on a machine. They first went to Canada and then southward to Mexico, whence they took the southern route to the Atlantic Coast. About six months were spent on the trip.

#### **Savannah Racing Results.**

The following is the summary of the recent race meet at Savannah, Ga.:

Five miles, 61 cubic inches—First, Davis, Excelsior; second, Schmitz, Indian.

Ten miles, 61 cubic inches—First, Schmitz, Indian; second, Davis, Excelsior.

Seven miles, open—First, Glenn, Indian; second, Schmitz, Indian.

Five miles, 61 cubic inches—First, Glenn, Indian; second, Schmitz, Indian; third, Buckner, Excelsior.

Ten miles, stock—First, Glenn, Indian; second, Schmitz, Indian.

Ten minutes, stock—Greatest distance, Glenn, Indian. Ten miles, open—First, Buckner, Excelsior; second, Glenn, Indian.

One mile trials, stock—First, Schmitz, Indian; second, Glenn, Indian.

One mile, open—First, Buckner, Excelsior; second, Glenn, Indian.

One mile, stock—First, Buckner, Excelsior; second, Glenn, Indian.

Three miles, stock—First, Schmitz, Indian; second, Buckner, Excelsior.

Four miles, open—First, Buckner, Excelsior; second, Schmitz, Indian.

Five miles, free-for-all—First, Schmitz, Indian; second, Buckner, Excelsior; third, Glenn, Indian.

Eleven miles, 61 cubic inches—First, Buckner, Excelsior; second, Glenn, Indian; third, Schmitz, Indian.

#### **Girls as Mountain Climbers.**

Miss Grace Selkurk and Miss Alice Selkurk, two girl motorcyclists of San Diego, Cal., have made a new record for climbing Mt. Wilson on a two-wheel machine. Just 58 minutes from the time the girls left the foot of the toll road they reached the summit, a distance of nine miles. The young ladies made the return trip in 35 minutes.

#### **General News Notes.**

A motorcycle was the first vehicle to cross the new \$75,000 viaduct at Waukegan, Ill.

George Olson, Minneapolis, Minn., recently returned from a week's motorcycle hunting trip. He had 10 partridges, 15 rabbits and a 250-pound deer strapped to his machine when he arrived home.

A mid-winter run has been planned by the motorcyclists of Ohio to the New York show in January.

Motorcycles are to be used in the police department of the city of Wheeling, W. Va.

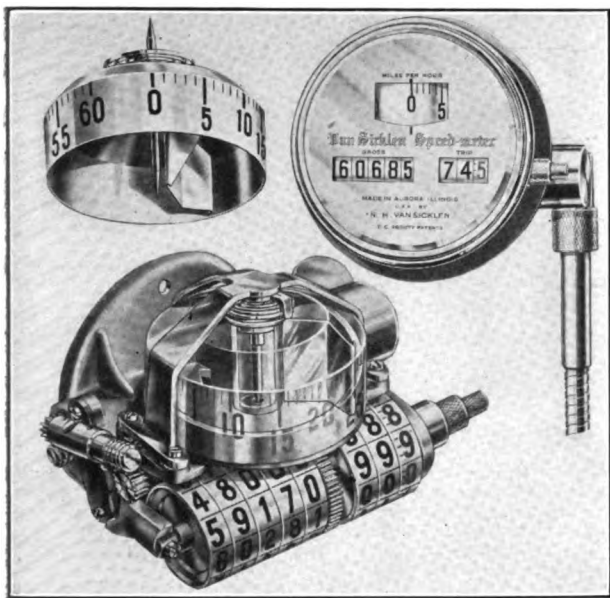
L. W. Hoffman, Canton, S. D., has just completed a 550-mile motorcycle trip through Iowa, Nebraska and South Dakota.

Practically every real estate firm in Louisville, Ky., employs one or more motorcyclists.



**Mr. and Mrs. B. A. Swenson, Providence, R. I., and Their Indian with Sidecar Attachment.**





**New Van Sicklen Motorcycle Speedometer, Completely Assembled and Disassembled to Show Components.**

These riders are attached to the collection departments and some of them are also sent out to look after complaints.

Gus Ehly and Jay McCullough, Minneapolis, Kan., recently rode their motorcycles to Broken Bow, Neb., where they staked claims on the reservation just opened by the government.

The work of the Moody Fresh Air Camp, Chicago, Ill., which has been giving healthy and happy summer vacations to hundreds of Chicago children, has been greatly facilitated by the use of a motorcycle.

#### Club Notes, Here and There.

The Lawndale Motorcycle Club, Chicago, Ill., has planned an endurance run from Chicago to Wilmette and return. The test will take place at the advent of the first snow storm of the winter.

The Aurora Motorcycle Club, Aurora, Ill., is considering plans for a new clubhouse to be built in the spring. The club already has an attractive house of five rooms, but the membership has grown to such proportions that larger quarters are now necessary.

Motorcyclists in Michigan are organizing a state F. A. M. A. R. Ketcham, Ann Arbor, has been appointed as state commissioner and he expects to get the different clubs together to have a state convention next June. Members of the Bay City Motorcycle Club are working to have the convention held in their city.

New F. A. M. affiliated clubs are announced as follows: Alamo, W. E. Dobrowolski, 203 Sycamore street, San Antonio, Tex.; Fort Smith, H. M. Swickard, 915 North A street, Fort Smith, Ark.; Gadsden, William B. Greene, lock box 4, Gadsden, Ala.

The state commissioners of Michigan and Ohio have appointed the following county commissioners: Donald A. Magill, Bay City, Mich., Bay county; Louis Beltrawites, Saginaw, Mich., Saginaw county; Dr. A. C. Carney, Hamilton, O., Butler county; L. O. Rhoades, Bloomer, O., and R. E. Morrison, Middletown, O.

B. J. Patterson, president of the F. A. M., has appointed F. S. Morse, 44 Grove street, Keene, N. H., commissioner for that state.

J. L. Donovan, chairman of the competition committee, has appointed the following state referees: W. V. Miller, Atlanta, Ga.; Arthur Mitchell, Montgomery, Ala. He has also appointed E. L. Moore, Seattle, Wash., as

North Pacific representative of the competition committee.

New registered repair shops have been announced as follows: H. F. Beck, 386 Monroe avenue, Memphis, Tenn.; Staples Motor & Supply Company, Staples, Minn.; Linehan Bros., 505 Market street, Steubenville, O.; Frederick Tiemeyer Motor & Supply Company, 1401 East Eager street, Baltimore, Md.; Whitney & Lange, 203 14th avenue, Cedar Rapids, Ia.; L. I. Goodrich, Goodland, Kan.; A. E. Counsell & Son, 36 Railroad street, St. Johnsbury, Vt.

#### Van Sicklen Speedometer.

An accompanying illustration presents the new Van Sicklen motorcycle speedometer, which was revealed just previous to the opening of the Chicago show. It is the product of the Van Sicklen Company, Aurora, Ill. The illustration shows the instrument completely assembled ready for installation and disassembled to indicate the working parts.

The speed dial is of the floating type. The figures are large and plain and instead of being set on one line are staggered, it being maintained that this permits of easier reading. The speed indicating mechanism is controlled by air, and it is claimed that it is not affected by temperature, climatic or other conditions.

The instrument also includes an odometer, with both trip and season dials, the former recording in tenths, to 100 miles, the miles in black and the tenths in red. This portion can be reset quickly at any time. Another feature is that the registration is steadily progressive, instead of utilizing wheels that turn one notch at a time. All dials are lithographed on a plain white enamelled surface. It is stated that it also will be made for automobiles.

The type that is supplied for motorcycles is driven by an endless wire belt running on V grooved pulleys, the driving pulley being attached to the spokes of the front wheel, from which point to a similar pulley at the end of the flexible shaft the power is transmitted by the belt. The bottom of the grooves in the pulley used for transmitting the power is hobbled to the same pitch as the coil of the belt.

#### JOIN THE F. A. M.

which is the National Organization fostering the interests of motorcyclists along legislative and other lines. Cut this out, mail it, and you will get the reasons.

#### E. M. ESTABROOK

Chairman Membership Committee Federation  
American Motorcyclists,  
BANGOR, MAINE.

Please send me the F. A. M. Booklet and all information interesting to prospective members.

Name.....

Address.....



# NEWS OF THE MANUFACTURER AND DEALER.

The following concerns have been incorporated recently to manufacture or deal in motor cars, accessories, etc.:

**Coast Four Wheel Drive Auto Company**, Everitt, Wash.; \$10,000; E. J. Kennedy, M. A. Kennedy, L. A. Frazier, C. R. Frazier.

**Ferguson Auto Springs Manufacturing Company**, Spokane, Wash.; \$1,000,000; A. B. Ferguson, F. W. Stephens.

**Sagamore Motors Corporation**, Syracuse, N. Y.; \$75,000; J. S. Brown, C. G. Hanna, E. W. Lawton.

**Roberts Gas & Gasoline Engine & Car Company**, Nashville, Tenn.; \$50,000; to manufacture engines.

**Ohio Tractor Sales Company**, Marion, O.; \$50,000; W. W. Williams, H. A. Stevens, N. M. Miller, W. H. Schaeffer, C. Lee.

**Northwestern Motor Company**, Eau Claire, Wis.; \$25,000; to manufacture motors; K. Roshold, T. W. Roshold, R. P. Roshold.

**Automobile Machine Company**, Canisteo, N. Y.; \$3000; springs and other parts; C. B. Schaumburg, W. E. McGreevy, C. L. Thomas.

**Taylor Motor Cut-Out Block Company**, Columbus, O.; to manufacture device for finding trouble in motors.

**Paige-Detroit Company of New York**, New York City; \$50,000; E. M. Dalley, S. J. Wise, F. W. Kolb.

**Fellboch Motor Company**, Milwaukee, Wis.; \$100,000.

**Clemens Motor Sales Company**, Buffalo, N. Y.; \$50,000; W. J. Clemens, J. G. Lesswing, R. B. Metro.

**Leather Tire Goods Company**, New York City; \$7000; tires and specialties; Hans Gurlitt, Dodge Loebmann, William Loebmann.

**St. Joseph Automobile Show Association**, St. Joseph, Mo.; \$2000; E. T. Rhodus, M. N. Hall, H. C. Davis.

**Indian Taxicab Company**, Rochester, N. Y.; \$5000; Henry F. Lucas, Anna B. Lucas, William S. Lucas.

**E. H. Garcin & Co.**, New York City; \$25,000; asbestos and rubber goods; E. H. Garcin, George E. Richards, George S. Fulton.

## WITH THE MANUFACTURER.

**The Mercury Cyclecar Company**, Detroit, has begun the production of Mercury cyclecars in the factory building at 807-815 Scotten avenue, shown in an accompanying illustration. It is stated by the company that deliveries will be begun about the middle of December.

H. C. Gentry, formerly with the Thermoid Rubber



Plant at 807-815 Scotten Avenue, Detroit, Where the Mercury Cyclecar Company Produces Mercury Cyclecars.

**Evinrude Motor Company**, Milwaukee, Wis.; \$350,000; A. Zinn, John F. Koch, C. J. Meyer, Walter A. Zinn.

**Goodwin-Gallivan Motor Company**, Newcastle, O.; \$10,000; to retail automobiles; William M. Goodwin, John C. Goodwin, James P. Gallivan.

**Maxwell Motor Sales Corporation**, Wilmington, Del.; \$10,000; James J. Butterly.

**Breese Motor Plow Company**, Wapakoneta, O.; \$100,000; Robert A. Breese, G. D. Norris, David Lerbach.

**Parsons Motor Car Company**, Windsor, Can.; \$500,000; to manufacture motor vehicles; Thomas G. Ellis, A. J. Denomy and others.

**Archibald Wheel Company**, Lawrence, Mass.; \$800,000; vehicle wheels; F. N. Andrews, E. H. Archibald, I. M. Archibald.

**Robinson Auto Heater Company**, Milwaukee, Wis.; \$25,000; to manufacture heating devices; J. K. Robinson, E. W. Robinson, H. L. Kellogg.

**H. L. F. Trebert Company**, Rochester, N. Y.; \$150,000; motors; H. L. F. Trebert, L. Gergoine Ogden and others.

**Motor Cigarette Company**, Buffalo, N. Y.; \$30,000; H. J. Cardigan, C. J. Kerm, A. M. Pearsall.

**Memphis Overland Company**, Memphis, Tenn.; \$5000; T. H. Smart, F. D. Graham, Roy Moyston, Earl King, Caruthers Ewing.

**New Jersey Auto Exchange**, Union, N. J.; \$10,000; George Rich, Jr., Henry E. Forscutt and others.

**H. M. Kinsman Company**, Norwood, N. Y.; \$25,000; H. M. Kinsman, H. L. Farmer, E. E. Wright.

Company, Trenton, N. J., has been appointed special factory representative of the Cataract Rubber Company, Wooster, O., in New York City and vicinity. His headquarters will be with Meyers & Grayson, 1608 Broadway, New York City, which firm has been appointed distributor for Cataract tires.

**The L. P. C. Motor Company**, recently formed in Racine Junction, Wis., has elected the following officers: President, Capt. William Mitchell Lewis; vice president and engineer, Rene M. Petard; secretary and sales manager, James M. Cram; treasurer, F. S. Cordon; general counsel, E. B. Hand; superintendent, O. R. Delamater; purchasing agent, C. B. Chamberlain.

**The H. W. Johns-Manville Company**, New York City, has removed its Toronto branch to 19 Front street, East, where it will have a store and warehouse with floor area of approximately 35,000 square feet. A larger stock of J-M automobile specialties and the other products manufactured by this concern will be carried than heretofore was possible.

**The Chase Motor Truck Company**, Syracuse, N. Y., has placed on the market a kerosene motor roller farm tractor, designed for the severe condition of soil and topography existing throughout the eastern United States. This tractor furnishes all traction and belt work required by the farmer.

**The Detroit Wagon Works**, Detroit, is making a new type tractor, which will be announced soon.

**The Detroit Steering Wheel & Windshield Company**,



*American Made for American Trade*

# NEW DEPARTURE

**GUARANTEED**

# BALL BEARINGS

To facilitate supplying demand for garages, dealers and owners, for New Departure ball bearings, the following distribution agencies are announced, where stock of these bearings is carried.

Ahlberg Bearing Co.....93 Mass. Ave., Boston, Mass.  
 Pruyn & Blodeau...1550 River St., Hyde Park, Boston, Mass.  
 Ahlberg Bearing Co.....1790 Broadway, New York City  
 Jos. C. Gorey & Co.....352 W. 50th St., New York City  
 The Gwilliam Co.....Broadway & 58th St., New York City  
 Pruyn & Blodeau,  
 1876 B'way., cor. W. 62nd St., New York City  
 Albany Hdwe. & Iron Co.....Albany, N. Y.  
 Syracuse Rubber Co.....212 S. Clinton St., Syracuse, N. Y.  
 Iroquois Rubber Co.....279-283 Washington St., Buffalo, N. Y.  
 Rochester Rubber Co.....24 Exchange St., Rochester, N. Y.  
 The Gwilliam Co.....1814 Arch St., Philadelphia, Pa.  
 Bumiller-Kemelin Co.....482 Main St., Cincinnati, O.  
 Cray Bros.....1111 West 11th St., Cleveland, O.  
 Hearsey-Willis Co.....Indianapolis, Ind.  
 Machinists Supply Co.....Pittsburgh, Pa.  
 Ahlberg Bearing Co.....2637 Michigan Ave., Chicago, Ill.  
 Chicago Pulley & Shafting Co.,  
 32-36 S. Clinton St., Chicago, Ill.  
 Herring Motor Supply Co..912-14 Locust St., Des Moines, Iowa.  
 Faeth Iron Co....1125-31 West Eighth St., Kansas City, Mo.  
 Pence Automobile Co..800 Hennepin Ave., Minneapolis, Minn.

Fred Campbell.....1109 Locust St., St. Louis, Mo.  
 Elyea-Austell Co.....Atlanta, Ga.  
 The Lininger Implement Co.,  
 Sixth & Pacific Sts., Omaha, Neb.  
 Denver Auto Goods Co.....1600 Broadway, Denver, Col.  
 Fry & McGill.....16th & Broadway, Denver, Col.  
 M. L. Foss.....1729 California St., Denver, Col.  
 Bertram Motor Supply Co.,  
 251 S. State St., Salt Lake City, Utah  
 J. W. Leavitt & Co..301 Golden Gate Ave., San Francisco, Cal.  
 Irvin Silverberg & Co..541 Van Ness Ave., San Francisco, Cal.  
 Kimball-Upson Co.,  
 609-11 K St., 608-15 Oak Ave., Sacramento, Cal.  
 Western Rubber & Supply Co.,  
 1011 S. Olive St., Los Angeles, Cal.  
 Western Rubber & Supply Co.,  
 66 S. Fair Oaks Ave., Pasadena, Cal.  
 Western Rubber & Supply Co..1364 Fifth St., San Diego, Cal.  
 Ballou & Wright.....Seventh and Oak Sts., Portland, Ore.  
 Ballou & Wright.....817 E. Pike St., Seattle, Wash.  
 Child, Day & Churchill Co....1215 First Ave., Spokane, Wash.  
 Automobile Supply Co.....Tacoma, Wash.

## New Departure Manufacturing Co.

**BRISTOL, CONN.**

When Writing to Advertisers, Please Mention The Automobile Journal.



Detroit, has changed its name to the Metalwood Manufacturing Company. The change affects the name only.

**The Mouhan Vehicle Company**, Providence, R. I., has



**Exterior of the White Company's Boston Branch at 930 Commonwealth Avenue.**

installed in its painting department a new compressed vapor cleaning system for cleaning cars before painting.

**The Dudley Tool Company**, Menominee, Mich., will produce a cyclecar along conventional lines with seats arranged tandem style.

**The Lee Tire & Rubber Company**, Conshohocken, Penn., has placed agencies for its tires with the Lee Tires Sales Company, Newark, N. J., and the Lee Tire & Rubber Company, Brooklyn, N. Y.

**The Pullman Motor Car Company** is making arrangements for the establishment of an agency in Boston, Mass.

**The Briggs-Detroit Company**, Detroit, maker of the Detroit cars, will be represented in New York State, New Jersey and all of New England, by a new company that has been formed under the name of the Detroit Motor Sales Company. Julius Lichtenstein is head of the new company.

**The Lord Motor Car Company** is to establish a new automobile plant at Los Angeles, Cal.

**The Front Wheel Drive Company**, Hoboken, N. J., maker of Christie automobile fire trucks, contemplates establishing its plant in Erie, Penn.

**The Champion Spark Plug Company**, Toledo, O., is now operating in its new four-story addition. The building gives the company 40,000 square feet more of floor space and increases the minimum capacity to 75,000 a year.

**The Dayton-Dick Company**, Quincy, Ill., maker of the "Da-Lite" generator and ignition and the Dayton-Dick starter, has moved into a new factory that affords ample floor space of 80,000 square feet. This plant is equipped with the latest design of machinery in all departments.

**The Firestone Tire & Rubber Company**, Akron, O., has established a service station at Des Moines, Ia. A building has been secured on Walnut street and machinery for repairing wheels and tires will be installed.

**The Allyne Brass Foundry**, Detroit, has awarded a contract for the erection of a one-story addition, 30 by 47 feet, to its plant on Crawford avenue.

**The Oregon Top Company**, Portland, Ore., has moved to larger quarters on East Eighth street.

**The Motor & Manufacturing Company**, Dunkirk, N. Y., has erected a new plant on East Second street.

**The Flyer Automobile Company** is to erect a plant in Mt. Clemens, Mich.

**The Gibson Motor Car Company**, Pittsburg, Penn., has purchased a building at Monaca and will remodel it for the manufacture of automobiles.

**The General Motors Company**, Detroit, has declared a semi-annual dividend of 3.5 per cent. on the preferred stock.

**The Goodyear Tire & Rubber Company**, Akron, O., has declared a dividend of 12 per cent. on the common stock.

**The White Company**, Boston, Mass., factory branch, is now housed in its new home at 930 Commonwealth avenue, Boston's new new Automobile Row. Accompanying

illustrations present exterior and interior views of the structure, but convey only a partial idea of the extensive arrangement of the building to accommodate the salesrooms and service station for White pleasure cars and trucks. The garage on Newbury street, further down town, has been retained.

**R. M. Bean**, who for some time past has been secretary of Claire L. Barnes & Co., Chicago, Detroit and Cleveland, now discontinued, has become sales manager for the Lefever Arms Company, Syracuse, N. Y., maker of transmissions for touring cars and transmissions and jackshafts for commercial vehicles.

#### GARAGE AND DEALER.

**The Auto Exhibit & Supply Company**, San Francisco, Cal., has moved into the quarters recently vacated by the Howard Automobile Company.

**A. F. Nelson**, Benson, Minn., has opened his new garage, which was recently erected at Kansas and Pacific avenues. The building is 126 by 50 feet.

**The Franklin Motor Car Company**, Rochester, N. Y., has opened new salesrooms and garage at 298-300 East avenue.

**The Ford Auto Garage Company**, Middleport, O., has moved to its new repair shop located on Third street in that city.

**The Automobile Tire Company**, New York City, has opened a branch at 14th and L streets, N. W., Washington, D. C.

**Angus J. Crites**, Bakersfield, Cal., has sold his interest in the Ford garage to his partners.

**E. J. Daly**, Hettinger, N. D., has repurchased his former garage.

**The Vesta Storage Battery Company**, New York City, located at 1718 Broadway, has become agent in New York State and New Jersey for the Empire gasoline economizer.

**The Rhineland Machine Works**, Detroit, has taken the agency for the A. V. shock absorber.

**The Pedneau Garage & Machine Works**, Raleigh, N. C., will build a new garage and machine shop.

**Thomas W. Cohoon**, Suffolk, Va., has purchased land on East Washington street and will build a new garage to cost \$3000.

**Fry Bros.**, Columbia, Tenn., is building a new fireproof garage on South Garden street which will be completed about the first of the new year. The company will handle automobiles and supplies.

**W. Leroy**, St. Louis, Mo., is preparing specifications for a one-story garage, 86 by 150 feet.

**Patrick Driscoll**, Harrisburg, Penn., is to erect a new one-story garage at a cost of \$8500.

**Bobb Bros.**, St. Louis, Mo., will erect a garage, 50 by 95 feet, to cost \$3000.

**Parker, Thomas & Rice**, Baltimore, Md., is preparing plans for a large commercial car garage to be erected on St. Paul street, that city, at a cost of about \$100,000.

**Jones & Harris**, Miami, Fla., will occupy a new large garage that will be erected on Avenue E by John Fro-



**Interior of White Pleasure Car and Truck Salesroom in Boston.**

hock. The building will also be used as a repair shop.

**The Shengren-Hunt Auto Garage**, Burlington, Ia., is to erect a new garage building.



## RECENT PATENTS.

**Adjustable Reamer**, Robert L. Ellery, Portsmouth, N. H., No. 1,077,463. Filed Aug. 17, 1912.

**Tire**, Gottlieb Anger, McKees Rock, Penn., assignor of one-half to Theodore A. Sprague, Bellevue, Penn., No. 1,077,504. Filed Oct. 28, 1912.

**Battery Box**, Charles A. Mahla, New York City, No. 1,077,539. Filed March 6, 1913.

**Wrench**, Samuel Moss, Waltham, Mass., No. 1,077,543. Filed Jan. 22, 1913.

**Vehicle Brake**, Stephen R. O'Brien, Pittsburg, Penn., No. 1,077,546. Filed March 24, 1913.

**Auto Dumping Truck**, Ernest Henry Vincent, Emeryville, Cal., No. 1,077,570. Filed June 20, 1911.

**Wrench**, Frank C. Wutke, Chicago, Ill., No. 1,077,575. Filed Feb. 25, 1913.

**Resilient Wheel**, Gilbert A. Leitzman, Clayton, Ind., No. 1,077,612. Filed July 25, 1912.

**Car Motor**, William F. Davis, Kansas City, Kan., assignor to McKeon Motor Car Company, No. 1,077,679. Filed Oct. 10, 1905.

**Combustion Engine**, Hugo Junkers, Aix-la-Chapelle, Germany, No. 1,077,718. Filed Oct. 7, 1907.

**Motor Control System**, Edwin J. Murphy and John E. Brobst, Schenectady, N. Y., assignors to General Electric Company, No. 1,077,737. Filed June 20, 1912.

**Sidecar Attachment for Motorcycles**, Oron Overton, Mobile, Ala., No. 1,077,743. Filed May 24, 1912.

**Nut Lock**, Alma P. Stark, Spanish Fork, Utah, No. 1,077,763. Filed Dec. 17, 1912.

**Shock Absorber**, Carl Yeager, Birdsboro, Penn., No. 1,077,781. Filed March 15, 1913.

**Resilient Tire**, David A. York, Northgrove, Ind., No. 1,077,782. Filed Dec. 7, 1912.

**Lubricating System for Gas Engines**, Julian P. Farnham, Minneapolis, Minn., assignor, by mesne assignments, to Emerson-Brantingham Company, Rockford, Ill., No. 1,077,823. Filed Feb. 9, 1912.

**Engine Starter**, John Deam Kneidler, Sioux City, Ia., assignor of one-third to Buel Couch and one-third to N. T. Hanson, same city, No. 1,077,841. Filed Sept. 17, 1912.

**Engine Starter**, Gilson W. Roth, Jackson township, Brown county, Ind., assignor, by direct and mesne assignments, to George H. Evans, Evansville, Ind., No. 1,077,858. Filed June 10, 1910.

**Muffler**, Edward L. Dewey, Whiting, Ind., No. 1,077,905. Filed March 10, 1913.

**Carburetor**, William H. C. Higgins, Laporte, Ind., No. 1,077,910. Filed Oct. 14, 1910.

**Stop Cock for Motor Vehicles**, Jean Mazuel, Paris, France, No. 1,075,429. Filed Feb. 3, 1913.

**Electrical Distributor**, James L. Adams, Jr., Wilkesburg, Penn., assignor to Westinghouse Electric & Manufacturing Company, No. 1,075,457. Filed Nov. 16, 1911.

**Self-Propelled Sleigh**, Andrew J. Denney, Cambridge, Idaho, No. 1,075,465. Filed Aug. 5, 1912.

**Connecting Means for Springs**, Jacques Minette de Saint Martin, Paris, France, No. 1,075,498. Filed Oct. 10, 1912.

**Demountable Rim**, Robert P. Scott, Cadiz, O., No. 1,075,501. Filed March 14, 1911.

**Wrench**, Robert W. Sturdy, Stephenson, Mich., assignor of one half to Cassius W. McEwan, Omaha, Neb., No. 1,075,516. Filed May 13, 1912.

**Explosive Engine**, Joseph F. Buhr, Detroit, assignor, by mesne assignment, to Herman B. Strate and Joseph F. Buhr, Detroit, No. 1,075,545. Filed Feb. 7, 1911.

**Indicating Device**, Mildred Felix, New York City, No. 1,075,555. Filed Feb. 23, 1907.

**Battery**, William H. Fenoughty, Belleville, Ill., assignor to American Carbon & Battery Company of Missouri, No. 1,075,556. Filed May 12, 1913.

**Automobile Construction**, Henry Ford, Detroit, No. 1,075,557. Filed July 21, 1909.

**Internal Combustion Engine**, Frederick O. Kilgore, Somerville, Mass., No. 1,075,578. Filed Dec. 28, 1911.

**Ignition and Starting Mechanism**, Loren E. Clark, Madville, Penn., No. 1,075,763. Filed Feb. 7, 1913.

**Frame for Motor Bicycles**, Edward Y. White, San Antonio, Tex., No. 1,075,886. Filed March 9, 1906.

**Two-Cycle Engine**, Ellis J. Woolf, Minneapolis, Minn., assignor to the Woolf Valve Gear Company, same place, No. 1,075,889. Filed Oct. 26, 1908.

**Electric Gearshift**, Ralph W. Bradley, Fort Collins, Col., No. 1,074,599. Filed Jan. 28, 1913.

**Radiator Vent Valve**, Andrew Jackson, Chicago, No. 1,074,624. Filed March 14, 1913.

**Muffler**, Charles Hinton Kenney, New London, Conn., No. 1,074,627. Filed March 29, 1913.

**Ignition System**, Leon J. LePontois, New Rochelle, N. Y., assignor by mesne assignments to H. W. Johns, No. 1,074,724. Filed June 15, 1909.

## COMING EVENTS.

## December.

Dec. 10-12—Convention, Retail Implement & Vehicle Dealers' Association, Milwaukee, Wis.

Dec. 11-20—International exposition of safety and sanitation, American Museum of Safety, New York City.

## January.

Jan. 2-10—Importers' Salon, Hotel Astor, New York City.

Jan. 3-10—Pleasure car show, Grand Central Palace, New York City.

Jan. 4-8—Winter meeting, Society of Automobile Engineers, New York City.

Jan. 10-16—Show, Milwaukee, Wis.

Jan. 10-17—Show, Cleveland, O.

Jan. 10-17—Show, Philadelphia, Penn.

Jan. 10-21—Show, Brussels, Belgium.

Jan. 12-17—Show, Bridgeport, Conn.

Jan. 17-24—Show, Pittsburg, Penn.

Jan. 17-24—Show, Detroit, Mich.

Jan. 24-31—Pleasure car show, Montreal, Que.

Jan. 24-31—Show, Rochester, N. Y.

Jan. 24-31—Pleasure car show, Colliseum, Chicago, Ill.

Jan. 26-31—Show, Scranton, Penn.

Jan. 31-Feb. 7—Show, Minneapolis, Minn.

## February.

Feb. 2-7—Pleasure car show, Buffalo, N. Y.

Feb. 3-7—Show, Kalamazoo, Mich.

Feb. 3-7—Commercial car show, Montreal, Que.

Feb. 4-7—Show, St. Joseph, Mo.

Feb. 7-12—Show, Seattle, Wash.

Feb. 9-14—Truck show, Buffalo, N. Y.

Feb. 16-21—Show, Kansas City, Mo.

Feb. 18-21—Show, Bloomington, Ill.

Feb. 21-28—Show, First Regiment Armory, Newark, N. J.

Feb. 21-28—Pleasure car show, Cincinnati, O.

Feb. 23-28—Show, Omaha, Neb.

## March.

March 2-4—Commercial car show, Cincinnati, O.

March 2-6—Show, Fort Dodge, Ia.

March 7-14—Pleasure car show, Mechanics' Building,

Boston, Mass.

March 9-14—Show, Des Moines, Ia.

March 17-21—Truck show, Mechanics' Building, Boston,

Mass.

## April.

April 9-15—Show, Manchester, N. H.

## May.

May 30—500-mile race, Indianapolis, Ind.

## July.

July 25-29—Grand Prix race, Belgium.

## NEW BOOKS RECEIVED.

**The Silent Knight Engine**—Reprint of a paper read by C. Y. Knight, and the discussion which followed, at the meeting of the Royal Automobile Club, London, England, Oct. 15, 1908.

**The Relation of the Manufacturer to Our Patent System**—Paper read by W. M. Grosvenor before the Boston meeting of the American Institution of Chemical Engineering, in June, 1913.

**The Marmon "Forty-Eight" in Service**—Published by the Nordyke & Marmon Company, Indianapolis, Ind. An interesting portfolio of photographs of Marmon cars taken in America and foreign countries.

**The Electric Vehicle Hand-Book**—Published by H. C. Cushing, Jr., Pulitzer building, New York City. Written by H. C. Cushing, Jr., and Frank W. Smith. An instruction book on the operation, care and maintenance of electric vehicles, their storage batteries, motors, controllers, tires and accessories. Price, \$2.



## RECENTLY ANNOUNCED 1914 MODELS.

**S**TILL another pleasure car maker has announced the abandonment of its four-cylinder models, this being the Locomobile, which will offer sixes exclusively for the 1914 season. For the most part, the new models announced during the past two weeks indicate but few changes in general design and construction, although there is abundant evidence of detailed refinements. The following brief descriptions are intended to present only the more important changes outlined by the manufacturers:

**Lozier**—Lozier Motor Company, Detroit. New series six-cylinder model and a new four. Four-cylinder motor, L head type, cast en bloc, with bore of 4.25 inches and stroke of 6.5. Enclosed valves, easily accessible. Cool-

ope, windshield, electric lighting and starting, electric horn, demountable rims, etc.

**De Soto**—De Soto Motor Car Company, Auburn, Ind. De Soto Six. Motor, six cylinders cast in pairs with bore of four inches and stroke of five. Lubrication, positive pump and level splash; cooling, centrifugal pump; ignition, lighting unit; carburetor, Schebler. Clutch, multiple disc, Raybestos lined. Transmission, selective, three speeds forward and reverse. Full floating rear axle. Front springs, semi-elliptic; rear, three-quarter elliptic. Wheelbase, 130 inches. Tires, 35 by four inches. Equipment includes: Electric lighting, pneumatic starter, top, curtains, windshield, either electric or exhaust horn, etc. Body seats five, with provision for two extra seats.

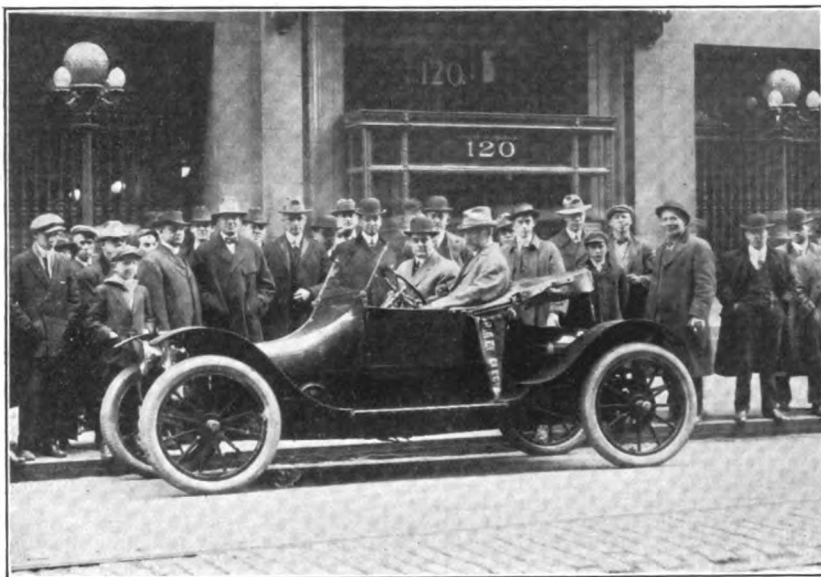
**Locomobile**—Locomobile Company of America, Bridgeport, Conn. Four six-cylinder models, which are really only two, rated at 38 and 48 horsepower respectively, each fitted with right and left hand drive and known as 38LD, 38RD, 48LD and 48 RD. Four-cylinder chassis has been dropped. Chassis show few changes, except in the left hand drive models, which have been altered to conform to the new placing of the operator. Improved carburetor design and new body lines. Gray & Davis electric system continued. Addition of six-cylinder air compressor.

**Austin**—Austin Automobile Company, Grand Rapids, Mich. Model 55. Motor, six-cylinder, T head type, cast in blocks of threes, replaces L head of last season. Exhaust on right, inlet on left. Bore four inches, stroke 5.5. Lubrication, force feed and splash; ignition, Bosch magneto. Two-speed rear axle retained. Left hand drive, centre control. Remy two-unit starting and lighting system, with LBA battery. Seven-passenger body, with disappearing seats, and with rear seat wide enough to hold four with comfort, it is maintained. Line also includes: Model 66, with motor of 4.5-inch bore and 5.5-inch stroke and model 77, with motor of 4.5-inch bore and seven-inch stroke. Both are six-cylinder engines and the construction is practically the same as model 55.

**Fal**—Fal Motor Car Company, Chicago, Ill. Greyhound model. New roadster, designed to be converted readily into a sleeping car if desired. Motor is a Buda, four-cylinder, en bloc, 4.25 inch bore, 5.5-inch stroke. Chassis design is standard throughout. By pushing the seat cushion forward upon the floorboards there is exposed sufficient room in the rear deck to admit a six-foot person, whose head is supposed to rest on the seat cushion. Body design is streamline throughout, and a feature is the installation of a single headlight in the centre of the hood extension, the radiator being about four inches behind the light.

**Bailey Electric**—S. R. Bailey & Co., Inc., Amesbury, Mass. Roadster. Continued from last season. Motor, specially designed General Electric. Battery, 60 cells Edison A-5. Mileage, 75 to 100. Speed, standard maximum, 25 miles an hour. Motor is connected to countershaft by Morse silent chain, final drive by double roller chain. Wheelbase, 112 inches. Tires, special electric pneumatic, 33 by four inches, on quick detachable rims. This is the type of car utilized by Col. E. W. M. Bailey on his recent Boston-Chicago tour. Company is also producing a special four-passenger roadster or touring car.

**Arbenz**—Arbenz Car Company, Chillicothe, O. Models show no radical changes, except such as to make for increased efficiency and ease of operation. Electric lighting and starting system, with dimming arrangement for headlights. Electric horn mounted under the hood. Fuel tank in cowl dash. Improved carburetor. Larger rear axle of full floating type. Healer wheels, fitted with quick detachable, demountable rims carrying 36 by four-inch tires. Spare rim. Wire wheels optional.



Col. E. W. M. Bailey Leaving Boston in the Bailey Electric Roadster on His Recent Boston-Chicago Trip.

ing, centrifugal pump, lubrication, pressure feed; ignition, Bosch high-tension magneto. Unit power plant. Multiple disc clutch. Selective transmission, four speeds forward and reverse. Full floating rear axle. Front springs, semi-elliptic; rear, Lozier platform. Left hand drive, centre control with ball type lever. Wheelbase, 120 inches; tread, 56. Tires, 36 by 4.5 inches. Equipment includes: One-man top, Kellogg four-cylinder tire pump, Gray & Davis electric lighting and starting system, electric headlight dimmers, etc. Six-cylinder chassis is a continuation of last season's model with the addition of refinements, and with the same equipment as the four. Two body designs on the four; seven-passenger touring car, convertible into five-passenger by disappearing seats folding into back of front seat, and two-passenger roadster.

**Paterson**—W. A. Paterson Company, Flint, Mich. Models 32 and 33. One chassis, two-passenger roadster and five-passenger touring car. Motor, four-cylinder, L head; bore 3.5 inches, stroke five. Lubrication, constant level splash; cooling, centrifugal pump. Unit power plant. Cone clutch. Selective transmission, three forward speeds and reverse. Front springs, semi-elliptic; rear, three-quarter elliptic. Wheelbase, 112 inches. Tires, 32 by 3.5 inches. Equipment includes: Top with envel-



## MAUDSLAY CAR ADOPTS RENO MOTOR.

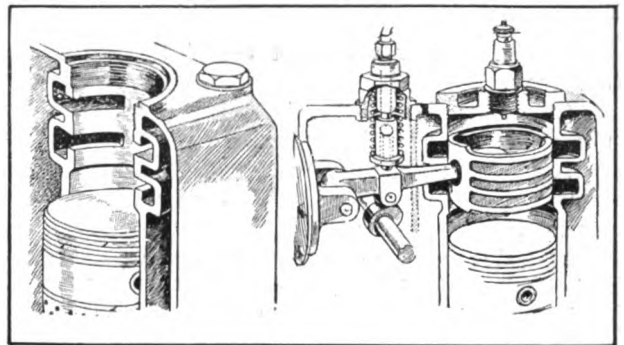
ONE of the most interesting features revealed at the recent Paris Salon in France and the Olympia show in London was the 17 horsepower Maudslay car, fitted with a four-cylinder Maudslay-Reno engine. This is not exactly a new motor, since it first made its appearance in America some time in the summer of 1911 and had been given tests on cars in Europe previous to that date. It originally was known as the Reno-Bois, and in this country was introduced as the Sphinx. The Maudslay design embodies some changes, as might be expected after more than two years of experimentation, and, so far as is known, this is the first time the motor has been offered as regular equipment on any make of machine.

Chief interest attaches to the engine because it is of the non-poppet valve type, employing a split ring, or cuff valve as it is termed abroad. The Maudslay Motor Company of Coventry, England, is an old established pleasure car manufacturer, and its reputation is such as to make its indorsement of the motor of distinct importance. The Maudslay-Reno will be in direct competition with the Knight double-sleeve valve and Argyll single-sleeve valve types, which have given decided satisfaction on the British market, to say nothing of the success of the Knight in America.

The principle of the design is simple. A perfectly plain, straight sided cylinder barrel is closed at its upper end by means of a screwed cap the full dimensions of the bore. Around the upper portion of this cylinder, in what forms the combustion space, are cast two circumferential slots, one above the other. In this section is fitted a cast iron split ring, the width, or rather the height, of which is such that it will completely cover both slots. Means are provided for moving this split ring from the position where it covers both slots, upward or downward, to uncover each in turn. One of the slots thus becomes the inlet port and the other the exhaust port. As the valve ring is split, the pressure of the gases on the inner sides of the ring, during the compression or firing strokes, tends to fortify the gas tightness of the joints.

The valve mechanism is operated by a camshaft, which is carried in a long circular passage through the water jackets of the cylinders, level with combustion chamber. The cylinders are cast in pairs and a single cam is mounted opposite the centre line of each. On each cam rests a roller carried in a fork forming part of a lever

which has its fulcrum in a detachable cap bolted to the side of the water jacket. The other end of the lever terminates in a ball, and the lever passes through a square hole in the cylinder wall to a lug, which is cast on one side of the split valve ring. This rocking lever projects through the cylinder wall until the ball end is situated centrally in the split ring valve casting. The ball end, however, is carried in a steel bushing, which serves to provide the wearing surface necessary to allow for the horizontal movement of the end of the lever as the latter is moved upward and downward in a radius. A recess is cut on the rocking lever, just above the fork which carries the roller, and in this works a spherical ended tappet shaped something like a dumb bell. The upper end of this dumb bell is carried in a plunger, which in turn works in a guide plug screwed into the upper horizontal fall of the main



**Maudslay-Reno Motor:** At Left, Sectional View with Valve Removed; at Right, Valve in Place and Operating Mechanism.

cylinder casting. Between the plunger on the one hand and the guide on the other is compressed a stout helical spring, and this, having to all intents and purposes the top wall of the casting for one abutment and the spherical end of the dumb bell for the other, serves to keep the rocking lever in close contact with the cam.

It will be understood that the normal position of the sliding split ring valve, during the compression and firing strokes, is such as to cover both slots. In this engine the lower slot forms the exhaust and the upper the inlet. The camshaft runs at half the engine speed. The cam blank consists primarily of a half circle, which allows the split ring valve to maintain its midway position; then, a considerable excrescence for a quarter of the circle, causing the valve to rise and thus open the exhaust port, and lastly, a depression below the midway radius for the remaining portion of the circle, which permits the valve to



drop below the normal position and open the inlet port.

Silent chain drive is employed for the camshaft, the chain case being carried at the forward end of the engine. Two chains are used, with an intermediate shaft and pinions rotating on ball bearings. On the rear face of the last cylinder is mounted an aluminum case which carries a chain drive, taken from the rear end of the camshaft, for the magneto, which is mounted on a plate attached to the chain case. At the front end of the engine, on the crankshaft, is a gear driving a short transverse shaft, which has a gear pump for lubrication at one end and a pump for water circulation at the other.

The lubrication system consists of a pressure feed to the five main bearings of the crankshaft, the webs and pins of which are drilled to enable oil to be forced to the big end bearings, etc. Surplus oil runs down to a sump in the bottom of the crankcase. An oil lead also is taken to the rear end of the circular passage in which the camshaft works, and the lubricant is forced along the hollow camshaft to all the camshaft bearings.

Considerable care has been taken to lubricate the mechanism which actuates the split ring valves. Each plug screwed into the upper wall of the cylinder casting, to form a guide for the spring loaded plunger which serves to hold each rocking lever in contact with its cam, is provided with an oil lead. Each plunger and dumb bell tappet is drilled so that oil can flow to the bottom spherical end of the tappet. Where the dumb bell tappet is recessed into the rocking lever another hole is drilled, and a passage from this is taken right along the lever to the ball end. It will be noted, by the drawings, that the sides of the ring are provided with three circular recesses, which serve to reduce friction and to a certain extent hold lubricant.

#### **PITTSBURG SHOW, FEB. 14-21.**

##### **Fourth Annual Event Will Include Pleasure and Commercial Cars.**

The Pittsburg Auto Show Association has completed arrangements for its fourth annual show, which will be held Feb. 14 to 21 inclusive. Pleasure and commercial vehicles will be exhibited, and the display will be known as the Big Exposition Auto Show. The officers of the Pittsburg Auto Association are as follows: President, Aaron DeRoy; vice president, J. Casper; secretary, J. D. White; treasurer, E. A. Will-

iams; board of directors, A. A. Buhl, C. C. Laughner, W. M. Laird, R. D. McCurdy and Elias Lange. J. H. Zimmerman is show manager and headquarters have been established at 130 North Highland avenue.

#### **BIG MILEAGE AT LOW COST.**

##### **Owner of 1910 KisselKar Pays \$48.75 for Repairs in 65,874 Miles.**

The durability of old machines is emphasized by the statement of F. H. Cunningham of Hoopston, Ill., who states that to date he has driven his 1910 KisselKar "50", made by the Kissel Motor Car Company, Hartford, Wis., 65,874 miles. "I have never had any engine trouble and the car is always ready to go day or night", writes Mr. Cunningham. "It has cost me all told only \$48.75 for repairs, and \$21.65 of that was for damage to another machine with which I came into collision. Mine was not even scratched in the accident".

#### **DEALERS FORM STATE BODY.**

##### **Local Associations in New York Organize for General Welfare Work.**

A meeting of delegates from the automobile dealers' associations throughout New York State was held in Albany, Dec. 3, for the purpose of organizing a state dealers' association. The bodies in Albany, Buffalo, Rochester, Syracuse, New York City and Brooklyn, and the Importers' Automobile Alliance of New York City, will comprise the nucleus of the new organization.

The following directors were chosen: Arthur M. Daly, New York City; R. E. Brown, Buffalo; Thomas Northway, Rochester; C. D. Hakes, Albany; G. H. Norris, Syracuse; E. Lascaris, Importers' Alliance, and H. I. Carpenter, Brooklyn. These directors elected the following officers: President, Arthur M. Daly; vice president, C. D. Hakes; treasurer, R. E. Brown; secretary and general manager, Charles A. Stewart, New York City.

The purpose of the new association is to promote the automobile industry in every way possible, to encourage and further the maintenance of good roads and the improvement of existing highways, to aid in the passage of uniform and consistent laws relating to motor vehicles, and to aid in the defeat of legislation detrimental to the industry.



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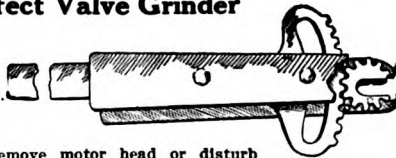
GOOD IN A DAY

STUTZ MOTOR CAR COMPANY      INDIANAPOLIS INDIANA

### WILL GRIND FORD VALVES

#### Wall's Perfect Valve Grinder

Patent Pending.  
Patents Allowed.



No need to remove motor head or disturb valve mechanism. A simple, practical tool, that works automatically and any one can operate it. Guaranteed, and will last for years. A new, simple and practical guide for owner, driver and repairer. Keep your valves in perfect condition. Cost of grinder saved first time used. For circulars and price list write

J. H. WALL, 290 Hope Street, BRISTOL, R. I.

Type 35  
Series J  
Raceabout  
Guaranteed  
Speed—Mile in  
51 Seconds



## MERCER

The car which most perfectly meets the medium weight demand. Dealers should carefully consider this fact.

Write today regarding unallotted Territory.

MERCER AUTOMOBILE CO., 1100 Whitehead Road  
TRENTON, N. J.

### For Your Tires' Sake and Your Own, Use The BROWN IMPULSE TIRE PUMP

with the  
B'CO Q. D. SPARK PLUG

A necessity, not an accessory. Ask your dealer or write us for full particulars.

THE BROWN CO., 222 Bellevue Ave., Syracuse, N. Y.

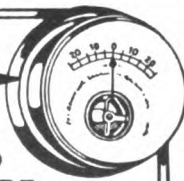
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**HOYT METERS**

AND GET YOUR MONEY'S WORTH

**HOYT ELECTRICAL WORKS**

PENACOOK, NEW HAMPSHIRE



**EMPIRE** The Completely Equipped Empire  
five-passenger touring car \$900  
"The Little Aristocrat"  
New Series Model 31  
NOW  
**\$900**

Advance catalogue is ready  
We will send the pictured  
story of the Transcontinental  
Empire on request.  
Empire Automobile Co., Indianapolis, U. S. A.

**DECARBONIZER**  
Chemically removes carbon from cylinders,  
pistons, rings and valves  
**INCREASES POWER 20 PER CENT.**  
Volatilizes carbon, in which form it passes out thru exhaust;  
injury to metal impossible. Again wanted in  
certain localities. Sample quart can \$1.50. Write  
today for particulars.  
**MILWAUKEE AUTO SPECIALTY COMPANY**  
126 Second St., Milwaukee, Wis.

For Perfect Control and Safe, Comfortable Driving use

## Weed Anti-Skid Chains

At all Reputable Dealers  
Weed Chain Tire Grip Co., New York

QUALITY **HARRIS** BEST FOR  
LUBRICANTS TRADE MARK REG. U.S. PAT. OFF. YOUR CAR  
**OILS**  
A. W. HARRIS OIL COMPANY  
326 S. Water St., PROVIDENCE, 143 N. Wabash Ave., CHICAGO

### APLCO ELECTRIC LIGHTS

"The right way to light the way"

Simple to install  
Economical to maintain  
Reliable at all times

Full information for the asking  
**THE APPLE ELECTRIC COMPANY**  
74 Canal St., Dayton, Ohio



**HAVOLINE**  
Automobile Cylinder Oils  
INDIAN REFINING CO.  
17 Battery Place New York

**Pyrene** FIRE EXTINGUISHER  
YOU CAN SAVE 15 PER CENT  
of your insurance premium every year by  
installing a Pyrene Fire Extinguisher in a  
convenient and conspicuous place on the  
dash-board of your automobile. For fur-  
ther particulars address  
**PYRENE COMPANY OF NEW ENGLAND**  
176 Federal Street, Boston, Mass.

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# The "Black Eagle" Spark Plug

PATENTED

## 50 Cents Is Enough

The "Black Eagle" Spark Plug has made good because it was designed and manufactured with this result in view.

A person in close touch with the supply and manufacturing ends of the trade was a visitor at our factory recently, and was shown the details of construction, including the machinery, testing, and assembling of the "BLACK EAGLE" Spark Plug. What he said we believe will be of interest to you, as it indicates the effort on our part to supply a high grade plug at a reasonable price. We therefore quote below his impressions.

"I am simply amazed at the workmanship, material, and construction of the 'BLACK EAGLE' Spark Plug. When I saw this plug advertised at a price of 50c to the consumer, I naturally supposed it was a cheap, common, plug such as you occasionally find in jobbing houses on the bargain counter. I am convinced, after seeing these plugs tested, and examining minutely the machine parts which enter into their construction, that no better porcelain spark plug is offered by any one, regardless of the price they ask."



We are not influenced by what our competitors charge for spark plugs! We have ignored price precedent, for the reason that a high grade spark plug can be manufactured and sold at 50c each, and that is enough.

Sent prepaid on receipt of price. Made in all standard threads.

### THE STANDARD CO.

### Torrington, Conn., U. S. A.

### THE "SIX-48" KEETON

REPRESENTS

The "finer points" of EUROPEAN DESIGN

\$3250 Completely Equipped

Interesting literature sent on request

KEETON MOTOR COMPANY

467 Lawton Ave.,

Detroit, Mich.

## HERZ PLUG

"BOUGIE MERCEDES"

### BEST ON EARTH

BLUE STONE AND STEEL

HERZ & CO.  
NEW YORK

## CATARACT TIRE SERVICE

THE 10% OVERWEIGHT TIRES

Guaranteed for 4000 Miles Service

Measured by Mileage, the Cheapest Shoes Ever Made. Clincher and Quick Detachable, Plain and Break-Skid Treads, Regular and Metric Sizes, for All Standard Rims.

THE CATARACT RUBBER COMPANY

Boston, New York, Providence.

Factory: WOOSTER, O.

## DIXON'S MOTOR CHAIN COMPOUND

Minimizes Friction and Doubles or Trebles the Life of a Chain. Write for the Book "Lubricating the Motor," No. 210.

JOSEPH DIXON CRUCIBLE CO.

Jersey City

(3)

New Jersey

## KING MOTOR CARS

For Long Service at Low Upkeep

### \$1095 WITH EQUIPMENT

Ward Leonard Starter and Generator \$100 extra.

30-35 H. P. Two Styles--Touring Car and Roadster.

KING MOTOR CAR CO., Detroit. Show Room, New York



THE  
STANDARDIZED  
CAR

The car that started the stampede to standardization  
A Cole franchise is a valuable asset to any dealer. Find out about it.

Cole Motor Car Co. of Indianapolis

## PREST-O-LITE IS THE MOST RELIABLE

LIGHTING SYSTEM

All the Facts on all Lighting Systems mailed you on request.

THE PREST-O-LITE CO., Inc., 226 Speedway, Indianapolis, Ind.

(2)

(Contributor to the Lincoln Highway)

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**THE MOTOR TRUCK**  
12 Issues. \$2.00 the Year.

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| <b>Dover Soap Economizer</b><br><br>Saves over one-third soap consumption | <b>Dover Electric Light Bulb Case</b><br>Safe and Very Compact<br><br>Send for Catalogue | <b>DOVER SAVAL MEASURE AND FUNNEL</b><br><br>With Automatic Shut-Off Prevents Overflowing Oil Tank |
|--|---|---|

**DOVER STAMPING & MFG. CO., Cambridge, Mass.**

**GYROSCOPE PRINCIPLE**

**The New Jones Speedometer Unaffected by Heat or Cold**

Any motor car maker will equip with it if you state plainly you want nothing else, no matter what speedometer he may list in his catalog as equipment.

Write us for facts, test and experiments that show Jones supremacy beyond question.

**THE JONES SPEEDOMETER—Broadway at 76th Street, NEW YORK**

The Easiest Riding Car in the World

**MARMON**

NEW SERIES MARMON "32" F. E. WING MOTOR CAR CO.  
 \$2850 to \$4100  
**THE MARMON SIX** 12 Columbus Ave., BOSTON  
 \$5000 to \$6350 New England Dealers for

**NORDYKE & MARMON CO., Indianapolis, Ind.**

**MOTOR PARTS COMPANY**  
 OFFICIAL  
**BOSCH DISTRIBUTOR**

Zenith Carburetor Mohawk Tires Leak-Proof Rings

185-187 Columbus Avenue, BOSTON  
 818 No. Broad St., PHILADELPHIA SPRINGFIELD, MASS.

**GOOD YEAR**  
 AKRON, OHIO

This name on Automobile Tires and Rubber Accessories signifies inherent qualities of material and workmanship that insure the maximum of service at the minimum of expense.

**THE GOODYEAR TIRE & RUBBER COMPANY, AKRON, OHIO (678)**

*Mea*

**Magneto**  
**S. R. O. BALL BEARING**

**MARBURG BROS., Inc.,**  
 Sole Importers  
 1790 Broadway, New York  
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Six Cylinder 65 H. P. Equipped with Vulcan Electric Gear Shift

**HAYNES**

Four Cylinder 40 H. P. Equipped with Vulcan Electric Gear Shift

**America's First Car**

Our advertising campaign will send a buyer into your showroom more than half convinced that he should own a Haynes; the sale, however, results only from a successful demonstration; it is our firm belief that, as a Haynes dealer, you possess more than a sufficient number of convincing arguments to make every demonstration result in a quick and profitable sale.

May we tell you why we believe this?

**THE HAYNES AUTOMOBILE COMPANY**  
 6 Main St., Kokomo, Indiana.

Bay State Autokit, No. 1, \$10  
 Bay State Autokit, No. 2, \$7.50  
 Bay State Stickit, \$3

**GEO. A. CUTTER, Sales Agent**  
 Taunton, Mass.

**GEISZLER NON-SULPHATING STORAGE BATTERIES**

Guaranteed perfect satisfaction or money refunded

**SIZE 66 - \$20.00**

**GEISZLER BROS. STORAGE BATTERY COMPANY**  
 514 West 57th Street, New York City

**WARNER AUTO-METER**  
 MAGNETIC PRINCIPLE

95% of all the speedometers to be made during 1913 will be built on the magnetic principle.

**Warner Auto-Meter Factory, Beloit, Wis.**  
 Address Dept. 9  
 Branches in all principal cities all over the world

**INSIST ON GETTING**  
**Colonial Motor Oil**

No substitute "just as good"

**Borne, Scrymser Company**  
 NEW YORK BOSTON FALL RIVER PHILADELPHIA

**"THE WELDING" COMPANY**

SPRINGFIELD BOSTON HARTFORD HOLYOKE  
 BRIDGEPORT SALEM

All Parts of Any Metal Welded and Guaranteed  
 ALUMINUM CASES AND CAST IRON CYLINDERS A SPECIALTY

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# Classified Buyers' Guide

A Handy Reference for Purchasers

## ACCESSORY MANUFACTURERS AND JOBBERS.

**Auto Parts Co.**, Providence, R. I.  
**Hopewell Brothers**, Newton, Mass.  
 Branch: 1974 Broadway at 67th St., New York.  
**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.  
**Miller, Chas. E.**, 97-103 Reade St., New York.  
 Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave. and 2782 Broadway, New York; 1421 Bedford Ave., Brooklyn, N. Y.; 313 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 259 Peachtree St., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.  
**Milwaukee Auto Specialty Co.**, 128 Second St., Milwaukee, Wis.  
**Motor Parts Co.**, 185-187 Columbus Ave., Boston; 818 No. Broad St., Philadelphia; Springfield, Mass.  
**Northwestern Chemical Co.**, Marietta, O.  
**Waite Auto Supply Co.**, 81 Exchange place, Providence.

## ACETYLENE TANKS. (See Tanks.)

## AIR COMPRESSORS AND TANKS.

**Williams Foundry & Machine Co.**, Akron, O.

## AMMETERS AND VOLTMETERS.

**Heyt Electrical Instrument Works**, Penacook, N. H.

## AUTOMOBILES. (See Cars.)

## AUTOMOBILE SPECIALTIES.

**Cox Brass Mfg. Co.**, Dudley Ave., Albany, N. Y. (Brass Goods.)

## BALLS AND BALL BEARINGS.

**Boyd, F. Shirley**, 903 Boylston St., Boston. (R. I. V.)  
**Hyatt Roller Bearing Co.**, Detroit.  
**Marburg Bros., Inc.**, 1790 Broadway, New York. (S. R. O.)  
**New Departure Mfg. Co.**, Bristol, Conn.  
**Rhineland Machine Works Co.**, 140 W. 42nd St., New York City.  
 Branches: 1254 Michigan Ave., Chicago, 650 Woodward Ave., Detroit; 1424 Vine St., Philadelphia; 220 Motor Mart, Boston.  
**R. I. V. Co.**, 1771 Broadway, New York. (R. I. V.)

## BATTERIES.

**Electric Storage Battery Co.**, Philadelphia. (Exide.)  
**Geissler Bros. Storage Battery Co.**, 514 W. 57th St., New York.  
**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City. (J-M.)  
**Waite Auto Supply Co.**, 81 Exchange place, Providence. (Success.)

## BATTERY EXTINGUISHERS.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.

(Continued on Next Page.)

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# Bosch Plugs

should be listed in the catalogue of every dealer. Free electros sent to any dealer who will show proof of publication.

Incidentally; Bosch Plugs had more than a 100 per cent. increase in sales—are you getting your share? All orders shipped promptly to those who want to make the fall's profit big.

"Locating the Spark Plug" tells you a lot about plugs. It's free on request.

## BOSCH MAGNETO COMPANY

204 West 46th St.

New York

Bosch Distributors for New England are located at: Portland, Me. Springfield, Mass., and at Boston.

SEMENTOL

## PLUG THAT RADIATOR LEAK PERMANENTLY

WITH

FINDS  
THE LEAK  
AND  
FIXES IT

"CHEMICALLY  
CORRECT"

Makers of

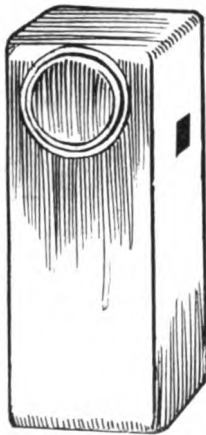
BRASS-KOTE



## WHY PAY COURT FINES

When you can avoid the nuisance by using a  
**Boston Tail Light Detector?**

(For electric lighting systems)



Attached to dash so that Red Light flares up before driver at instant of trouble with taillight.

Can be attached on average car in five minutes. Full description so that service of electrician is not required.

**Price 5 Dollars**

This device is also arranged for wiring up speedometer or dash lights as you desire to make such installations.

Agents wanted everywhere.

Write for territory and terms.

**The Harding Specialties Co.**

755 Boylston St., Boston. Phone B. B. 5385-W.

## GRAND PACIFIC HOTEL

Jackson Boulevard and Clark St. CHICAGO  
 CENTRALLY LOCATED

Within easy reach of all Railway Stations and only a few minutes to The Coliseum, where the Automobile Show is to be held.

All rooms newly equipped and decorated. Superb restaurant service at moderate prices. European plan.

### RATES

With Bath, \$2.50 a Day and Upwards

Without Bath, \$1.50 a Day and Upwards

J. T. TOWNSEND, Manager

## THE HEINZE ELECTRIC COMPANY

MANUFACTURERS OF

**Ignition and  
Generating Apparatus**

LOWELL, MASS.

Factory and Main Office:  
LOWELL, MASS.

Sales Office:  
DETROIT, MICH.

## (BUYERS' GUIDE—Continued.)

### BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

### BRAKE BANDING OR LINING.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (J-M Non-Burn.)

Standard Woven Fabric Co., Framingham, Mass. (Multibestos.)

Branches: F. Shirley Boyd, 903 Boylston St., Boston; C. D. Schmidt, 276 Canal St., New York City; N. A. Petry Co., 1427 Vine St., Philadelphia; F. E. Sparks, 1430 Michigan Blvd., Chicago; Fred Ward & Son, San Francisco.

### BRUSHES, WIRE.

Williams Foundry & Machine Co., Akron, O.

### BUMPERS AND FENDERS.

Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.

Sager Co., J. H., 271 South Ave., Rochester, N. Y. (Diamond.)

### CABLES. (See Wires.)

CARBON REMOVERS. (See Cylinder Cleaning Compound.)

### CARS—ELECTRIC PLEASURE.

Anderson Electric Car Co., 458 Clay Ave., Detroit. (Detroit Electric.)

Baker Motor Vehicle Co., Cleveland. (Baker.)

### CARS—GASOLINE PLEASURE.

Austin Automobile Co., Grand Rapids, Mich. (Austin.)

Cartercar Co., Pontiac, Mich. (Cartercar.)

Cole Motor Car Co., Indianapolis, Ind. (Cole.)

Empire Automobile Co., Indianapolis, Ind. (Empire, Little Aristocrat.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Keeton Motor Co., Detroit. (Keeton.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

Maxwell Motor Co., Inc., Detroit. (Maxwell.)

Mercer Automobile Co., 1100 Whitehead Road, Trenton, N. J. (Mercer.)

Moline Automobile Co., E. Moline, Ill. (Moline.)

National Motor Vehicle Co., 1033 22nd St., Indianapolis. (National.)

Nordyke & Marmon Co., Indianapolis. (Marmon.)

Owen & Co., R. M., 19 W. 62nd St., New York City. (Reo.)

Paige-Detroit Motor Car Co., Detroit. (Paige.)

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Arrow.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Studebaker Corp., Detroit. (Studebaker.)

Stutz Motor Car Co., Indianapolis. (Stutz.)

(Continued on Next Page.)

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## (BUYERS' GUIDE—Continued.)

**White Co., The**, 828 E. 79th St., Cleveland. (White.)  
**Branches:** 320 Newbury St., Boston; Broadway and 62nd St., New York; 629-633 North Broad St., Philadelphia; 138-148 Beatty St., Pittsburg, Penn.; 610 S. Michigan Ave., Chicago; Market St. and Van Ness Ave., San Francisco; 120-122 Marietta St., Atlanta, Ga.; 74 Victoria St., Toronto, Can.

**Willys-Overland Co.**, Toledo, O. (Overland.)

## CARS—STEAM PLEASURE.

**White Co., The**, 828 E. 79th St., Cleveland. (White.)  
**Branches:** See Cars—Gasoline Pleasure.

## CARS—GASOLINE COMMERCIAL.

**Adams Bros. Co.**, Findlay, O. (Adams.)  
**Bessemer Motor Truck Co.**, Grove City, Penn. (Bessemer.)  
**Blair Mfg. Co.**, Newark, O. (Blair.)  
**Cartercar Co.**, Pontiac, Mich. (Cartercar.)  
**Dart Manufacturing Co.**, Waterloo, Ia. (Dart.)  
**Driggs-Seabury Ordnance Corp.**, Sharon, Penn. (Vulcan.)  
**Federal Motor Truck Co.**, Junction and Leavitt Sts., Detroit. (Federal.)  
**Garford Co.**, Elyria, O. (Garford.)  
**General Motors Truck Co.**, 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)  
**Branches:** New York, Chicago, Boston, Philadelphia, Kansas City.

**Gramm-Bernstein Co.**, Lima, O. (B. A. Gramm's.)  
**Knox Automobile Co.**, Springfield, Mass. (Knox and Martin Tractor.)  
**Owen & Co.**, R. M., 19 W. 62d St., New York City. (Reo.)  
**Pierce-Arrow Motor Car Co.**, Buffalo, N. Y. (Pierce-Arrow.)  
**Reo Motor Car Co.**, Lansing, Mich. (Reo.)  
**Studebaker Corp.**, Detroit. (Studebaker.)  
**Sullivan Motor Car Co.**, 1707 East Ave., Rochester, N. Y. (Sullivan.)  
**Willet Engine & Truck Co., Inc.**, 8-10 Lock St., Buffalo. (Willet.)  
**Willys-Overland Co.**, Toledo, O. (Overland.)

## CARS—ELECTRIC COMMERCIAL.

**Anderson Electric Car Co.**, 458 Clay Ave., Detroit. (Detroit Electric.)  
**Atlantic Vehicle Co.**, Factory, Newark, N. J.; 1600 Broadway, New York City; 10 Postoffice Sq., Boston. (Atlantic.)  
**Baker Motor Vehicle Co.**, Cleveland. (Baker.)  
**Couple-Gear Freight-Wheel Co.**, 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)  
**Branches:** 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.  
**General Motors Truck Co.**, 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)  
**Branches:** See Cars—Gasoline Commercial.  
**General Vehicle Co.**, Long Island City, N. Y. (G. V.)

## CARS—FIRE, POLICE AND MUNICIPAL SERVICE.

**Cartercar Co.**, Pontiac, Mich. (Cartercar.)  
**Couple-Gear Freight-Wheel Co.**, 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)  
**Branches:** See Cars—Electric Commercial.  
**Knox Automobile Co.**, Springfield, Mass. (Knox and Martin Tractor.)  
**White Co., The**, 828 E. 79th St., Cleveland. (White.)  
**Branches:** See Cars—Gasoline Pleasure.  
**Willys-Overland Co.**, Toledo, O. (Overland.)  
 (Continued on Next Page.)

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## What the J. M. is doing for "Globe- girdler" Kohl

Edwin F. Kohl set out from the University of Wisconsin last summer to circle the globe by motor car. Taking his cue from A. L. Westgard, the world's most experienced pathfinder, he equipped his car with

## J. M. Shock Absorbers

Here is what Kohl wrote from Brussels:

The "J. M.'s" have made the around-the-world journey so smooth for me that I was not given a "jolt" to remind me that I should express my appreciation for what your product has done for the world-girdling car. We have traversed four European countries to date: Great Britain, France, Holland and Belgium, and the "J. M.'s" in the back are certainly doing all that your literature assures for them. During the past few days we have been traveling over nothing but cobblestones for hundreds of miles, but we do not seem to get any more jolting than over other pavements. The "J. M.'s" seem to be especially adapted for taking up short, successive bumps, for which this part of the world is notorious.

Your debtor for touring comfort,

EDWIN F. KOHL.

What are the reasons for the universal use of J. M. Shock Absorbers in every country where automobiles run? Real service—proved facts, rather than mere claims. The Ovington data chart "D" tells the whole story by eight simple lines, drawn by the car itself. No more convincing piece of shock absorber literature was ever issued. Do you want a copy? Write today.

## J. M. Shock Absorber Co., Inc.,


Main Office and American Factory:

210 South 17th St., Philadelphia, Pa.

**BRANCHES:** New York, N. Y., 218 W. 84th St.; Chicago, Ill., 1467 Michigan Ave.; Buffalo, N. Y., 846 Main St.; Pittsburgh, Pa., 5919 Baum St.; Atlantic City, N. J., 12 S. Virginia Ave.; Baltimore, Md., 10 W. Eager St.; Washington, D. C., 1803 M St., N. W.; Hartford, Conn., 230 Main St.; Cleveland, O., 5906 Euclid Ave.; Cincinnati, O., 801 Main St.; Boston, Mass., 222 Elliot St.; Jacksonville, Fla., 200 Lauro St.; Providence, R. I., 11 Dorrance St.; Newark, N. J., 237 Halsey St.; Brooklyn, N. Y., 143 Rogers Ave.; Albany, N. Y., 288 Central Ave.; Indianapolis, Ind., 425 N. Meridian; Springfield, Mass., 138 Dartmouth Terrace; Altoona, Pa., 1009 Chestnut Ave.; Trenton, N. J., 127 Academy St.; Minneapolis, Minn., Cor. Hennepin and Harmon Place; St. Louis, Mo., San Francisco, Cal.; Los Angeles, Cal.; Orlando, Fla.; Erie, Pa.; Atlanta, Ga.; Houston, Tex.; Dallas, Tex.; Kansas City, Mo.; Pottstown, Pa.; New Orleans, La.  
**CANADIAN DISTRIBUTORS:** Canadian Fairbanks-Morse Co., Ltd., Montreal, Quebec, Ottawa, Toronto, Ont.; Hamilton, Winnipeg, Man.; Saskatoon, Sask.; Calgary, Alta.; Edmonton, Vancouver and Victoria, B. C.; St. John's, N. B.

BRANCHES IN EVERY CIVILIZED COUNTRY





The performance of Eisemann Ignition Systems during the Indiana-Pacific Tour justifies every claim we have ever made for Eisemann efficiency and dependability.

**The Eisemann Magneto Company**  
 Sales and General Offices  
 225-227 West 57th St., New York  
 Indianapolis, Ind. 514 North Capitol Ave.  
 Detroit, Mich. 802 Woodward Ave.

*National*

**FIVE MODELS STOCK CHAMPION** \$2750 to \$3400  
 Electric Starter Electric Lights  
**National Motor Vehicle Co., Indianapolis**

**EVERYTHING FOR THE AUTOMOBILE**

**WAITE AUTO SUPPLY CO.**  
**Manufacturers and Jobbers**  
**81 Exchange Place Providence, R. I.**

*Studebaker*

"Accessibility of the motor a leading feature"  
**"25"—\$885 "35"—\$1290 "SIX"—\$1550**  
 All prices for cars fully equipped F. O. B. Detroit.  
**STUDEBAKER, - - - DETROIT, MICH**

**Mosler Spit Fire**  
 Plugs ARE THE BEST  
**A. R. MOSLER & CO.,**  
 P. O. BOX "M"  
 MT. VERNON, N. Y.

## Cartercar

With the gearless transmission—will give better service than is possible for a gear car. Unlimited speeds—climbs steep hills—gives double the usual tire mileage.

**CARTERCAR COMPANY, Pontiac, Mich.** Send for catalog

## (BUYERS' GUIDE—Continued.)

### CEMENTS.

**Johns-Manville Co., H. W.,** Madison Ave. and 41st St., New York City.

**Northwestern Chemical Co.,** Marietta, O. (Se-ment-ol Ra-di-ator.)

### CHAINS, TIRE AND ANTI-SKIDDING DEVICES.

**Weed Chain Tire Grip Co.,** 28 Moore St., New York.

### CHAINS—TRANSMISSION OR DRIVING.

**Boyd, F. Shirley,** 903 Boylston St., Boston. (Baldwin.)

**Miller, Chas. E.,** 97-103 Reade St., New York. (Brampton.)

**Branches:** See Accessory Manufacturers and Jobbers.

### COILS.

**Heinze Electric Co.,** Lowell, Mass.

### CYLINDER CLEANING COMPOUND.

**Cox Brass Mfg. Co.,** Dudley Ave., Albany, N. Y.

**Milwaukee Auto Specialty Co.,** 128 Second St., Milwaukee.

**Northwestern Chemical Co.,** Marietta, O. ((Carbonox.)

**Prest-O-Lite Company,** 271 East South St., Indianapolis. (Prest-O-Carbon Remover.)

**Branches:** Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Indianapolis, Jacksonville, Kansas City, Los Angeles, Milwaukee, Minneapolis, New York, Omaha, Philadelphia, Pittsburg, Providence, San Francisco, Seattle, St. Louis and St. Paul.

### FIRE EXTINGUISHERS.

**Johns-Manville Co., H. W.,** Madison Ave. and 41st St., New York City.

**Northwestern Chemical Co.,** Marietta, O. (Fire-Fly.)

**Pyrene Co. of New England,** 176 Federal St., Boston.

### FUNNELS.

**Dover Stamping & Manufacturing Co.,** Cambridge, Mass. (Dover.)

**GARAGES, PORTABLE.** (See Houses, Portable Steel.)

### GASKETS AND GASKET CUTTERS.

**Brown Co., Inc., Chas. D.,** 49 Federal St., Boston. (Vel-lumoid.)

**Shawver Co.,** Springfield, O.

### GEARS, STEERING.

**Ross Gear & Tool Co.,** 794 Heath St., Lafayette, Ind.

**GUNS, GREASE.** (See Oil Pumps.)

### HORNS.

**Dean Electric Co.,** Elyria, O. (Tuto.)

**Johns-Manville Co., H. W.,** Madison Ave. and 41st St., New York City.

**Kent Mfg. Works, Atwater,** 4937 Stenton Ave., Wayne Junction, Philadelphia. (Monoplex.)

### HOUSES, PORTABLE STEEL.

**Kolb Sales Co.,** 1790 Broadway, New York. (Ruby.)

(Continued on Next Page.)

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(BUYERS' GUIDE—Continued.)

IGNITION EQUIPMENT.

**Kent Mfg. Works, Atwater,** 4937 Stenton Ave., Wayne Junction, Philadelphia.

INSULATION.

**Johns-Manville Co., H. W.,** Madison Ave. and 41st St., New York City.

JACKS, ETC.

**Shawver Co.,** Springfield, O.

LAMP COVERS.

**Hopewell Brothers,** Newton, Mass. (Hopewell.)  
Branch: 1974 Broadway, New York.

LIGHTING SYSTEMS, ELECTRIC.

**Apple Electric Co.,** Dayton, O. (Aplco.)

**Dean Electric Co.,** Elyria, O. (Dynalux.)

**Johns-Manville Co., H. W.,** Madison Ave. and 41st St., New York City.

**Remy Electric Co.,** Anderson, Ind. (Remy.)

LUBRICANTS.

**Borne, Scrymser Co.,** 80 South St., New York. (Colonial.)  
Branches: Boston, Fall River, Philadelphia.

**Dixon Crucible Co., Jos.,** Jersey City, N. J., (Graphite.)

**Eagle Oil & Supply Co.,** 104 Broad St., Boston. (Eagle-line No-Karbon.)

**Harris Oil Co., A. W.,** 326 South Water St., Providence. (Harris.)

Branch: 143 No. Wabash Ave., Chicago.

**Haws, Geo. A.,** 148 Front St., New York. (Panhard.)

Branch: 899 Boylston St., Boston.

**Indian Refining Co.,** 17 Battery Place, New York. (Distributors of Havoline Oil.)

Branches: Pacific Coast—Kohl Bldg., San Francisco; Western—People's Gas Building, Chicago; Southern—Title Guarantee & Trust Bldg., Birmingham, Ala.; First National Bank Bldg., Cincinnati, O.; Lynchburg, Va.; St. Paul.

**Invader Oil Co.,** 80 Broad St., New York. (Invader.)

Branches: 284 Columbus Ave., Boston; 113 Arch St., Philadelphia; 512 Kenols Bldg., 11 and G Sts., N. W., Washington, D. C.

**Miller, Chas. E.,** 97-103 Reade St., New York. (Pan-American.)

Branches: See Accessory Manufacturers.

**New York & New Jersey Lubricant Co.,** 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)

**Northwestern Chemical Co.,** Marietta, O. (Gear-Silence.)

**Standard Oil Co.,** New York. (Polarine.)

Branches: In all cities.

**Texas Company, The,** 7 West St., New York.

Branches: Boston, Philadelphia, Chicago, St. Louis, Norfolk, Atlanta, New Orleans, Dallas, El Paso, Pueblo.

**Vacuum Oil Co.,** Rochester, N. Y. (Mobiloil.)  
Tulsa, Houston.

Branches: 49 Federal St., Boston; 29 Broadway, New York; Fourth and Chestnut Sts., Philadelphia; 154 Exchange St., Bangor, Me.; 406 Hitchcock Bldg., Springfield, Mass.; 117 Commercial St., Portland, Me.; Fisher Bldg., Chicago; Ford Bldg., Detroit; Indiana Pythian Bldg., Indianapolis.

**Valvoline Oil Co.,** 27 State St., Boston. (Valvoline.)

MAGNETOS AND SUPPLIES.

**Bosch Magneto Co.,** 223-225 W. 46th St., New York.

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Jackson, Mich.

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Branches: 514 No. Capitol Ave., Indianapolis; 802 Woodward Ave., Detroit.

Heinze Electric Co., Lowell, Mass. (Heco.)

Marburg Bros., 1790 Broadway, New York. (Mea.)

Remy Electric Co., Anderson, Ind. (Remy.)

Splittdorf Electrical Co., 98 Warren St., Newark, N. J.

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Northwestern Chemical Co., Marietta, O. (Hydrometers and Thermometers.)

## MOTORCYCLES AND SUPPLIES.

Miami Cycle & Manufacturing Co., 320 Hanover St., Middletown, O. (Flying Merkel.)

## MOTOR STARTERS.

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Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.

Remy Electric Co., Anderson, Ind. (Remy.)

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Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

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Northwestern Chemical Co., Marietta, O. (Never-Rust.)

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Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

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Brown Co., Syracuse, N. Y. (Brown Impulse.)  
 Cox Brass Mfg. Co., Dudley Ave., Albany, N. Y.  
 Dewey-Anderson Co., Toledo, O. (Dewey Power.)  
 Shawver Co., Springfield, O.

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Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (Asbestos.)

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Rhineland Machine Works Co., 140 W. 42nd St., New York City. (Lindhe Laminated.)  
 Branches: See Balls and Ball Bearings.

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Boyd, F. Shirley, 903 Boylston St., Boston.  
 Hudson Export and Import Co., 140 W. 42nd St., New York City. (A. V.)

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are NEW and SPECIALLY CONSTRUCTED for FORD CARS.

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**Thousands of Car Owners All Over the World  
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**J. M. Shock Absorber Co.,** 210 So. 17th St., Philadelphia. (J. M.)  
**Sager Co., J. H.,** 271 South Ave., Rochester, N. Y. (Peerless.)

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 Branches: See Magnetos and Magneto Supplies.  
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**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City.  
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**Rhineland Machine Works Co.,** 140 W. 42nd St., New York City.  
 Branches: See Balls and Ball Bearings.  
**Spiltdorf Electrical Co.,** 98 Warren St., Newark, N. J.  
 Branches: See Magnetos and Magneto Supplies.  
**Standard Co., The,** Torrington, Conn. (Black Eagle.)

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**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City. (Electric.)  
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**Northwestern Chemical Co.,** Marietta, O. (Hydrometers and Thermometers.)  
**Service Recorder Co.,** 2245 East 105th St., Cleveland. (Servis.)  
**Stewart-Warner Speedometer Corp.,** Chicago. (Auto-Meter.)  
 Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit; 330 1/2 North Illinois St., Indianapolis; 1613 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia; 5940 Kirkwood Ave., Pittsburgh; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

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**Boyd, F. Shirley,** 903 Boylston St., Boston. (Baldwin.)  
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## THE AUTOMOBILE JOURNAL.

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#### STEEL, ETC.

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**Harding Specialties Co., Inc.**, 755 Boylston St., Boston.  
(Boston.)

#### TANKS, ACETYLENE GAS.

**Prest-O-Lite Company**, 271 East South St., Indianapolis.  
(Prest-O-Lite.)  
Branches: See Cylinder Cleaning Compound.

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Branch: New York City.

#### TANKS, TIRE INFLATING.

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Tire Filler, The Emancipator.)  
Branches: See Cylinder Cleaning Compound.

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**Hopewell Brothers**, Newton, Mass. (Hopewell.)  
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**Cataract Rubber Co.**, Wooster, O. (Cataract.)

**Dayton Rubber Mfg. Co.**, Dayton, O. (Dayton Airless.)

**Gaulois Tire Corp.**, 1926 Broadway, New York. (Gaulois.)

**Goodyear Tire & Rubber Co.**, Madison St., Akron, O. (No-Rim-Cut.)

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**United States Tire Co.**, Broadway and 58th St., New York.  
(Continental, G & J, Hartford, Morgan & Wright.)

Branches: See Rims—Removable and Detachable.

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Branches: Boston, New York, Providence.

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If you plan to keep your car in service through the cold weather you especially need



because it is impervious to change in temperature. It lubricates as perfectly at zero as in warm weather.

If you are planning to house your car for the winter, it will pay you to clean out all the bearings and gears and repack them with NON-FLUID OIL. This lubricant does not dry or gum when the car is idle and will not cause the slightest corrosion of balls and rollers

NON-FLUID OIL excludes moisture and prevents rust.

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Send for Pleasure or Commercial Catalogue.  
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Are of the highest quality and the cheapest on mileage. They are built to last. Send for price list and particulars.

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Next issue Dec. 29th.

## Accessory and Garage Journal

TIMES BUILDING, PAWTUCKET, R. I.

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#### TIRES—SOLID AND COMMERCIAL.

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**Polack Tyre and Rubber Co., 246 W. 59th St., New York City.** (Polack.)  
**United States Tire Co., Broadway and 58th St., New York.**  
 Branches: See Rims—Removable and Detachable.

#### TOPS AND ATTACHMENTS.

**Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.**

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 Branch: 1974 Broadway, New York.

**TRUCKS AND TRACTORS—**(See Cars, Commercial.)

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#### TURNTABLES.

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**Winsor Manufacturing Co., Providence, R. I.**

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#### VULCANIZERS.

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**Williams Foundry & Machine Co., Akron, O.**

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**Autogenous Welding Equipment Co., Springfield, Mass.**

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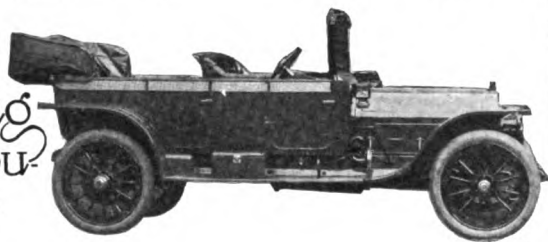
**Prest-O-Lite Co., 309 W. South St., Indianapolis.** (Prest-O-Welder.)  
 Branches: See Cylinder Cleaning Compound.

#### WRENCHES AND COMBINATION OUTFITS.

**Allen Wrench & Tool Co., Providence, R. I.** (Allen Friction Socket Sets.)  
**Coes Wrench Co., Worcester, Mass.**  
**Cutter, George A., Taunton, Mass.**  
**Walworth Manufacturing Co., Boston.** (Stillson.)

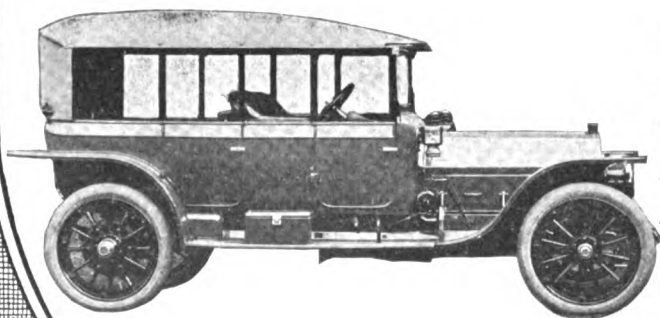


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SPRINGFIELD CONVERTIBLE BODY is always ready and always has



the accommodation and protection you desire.

Can be raised or low-

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**SPRINGFIELD METAL BODY CO.**

**SPRINGFIELD**

**MASS.**



# BIG NEW YORK SHOW NUMBERS

Advance, December 25, 1913



Review, January 10, 1914

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Make your reservation of space at once therein.

**The Automobile Journal**

**TIMES BUILDING**

**PAWTUCKET, R. I.**



VOL. XXXVI.

NO. 10.

# AUTOMOBILE JOURNAL

\$1.00 the year  
10 cents the Copy

PAWTUCKET R.I.

December 25, 1913

## HAVOLINE OIL

For Perfect  
Lubrication of  
Automobile



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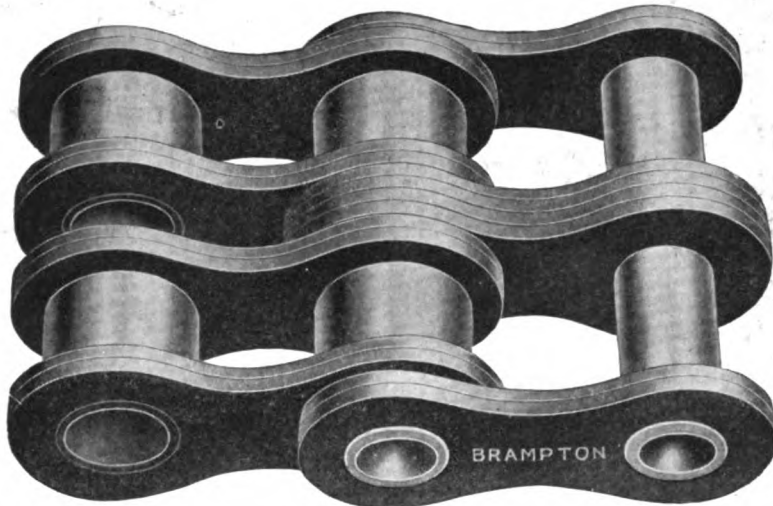
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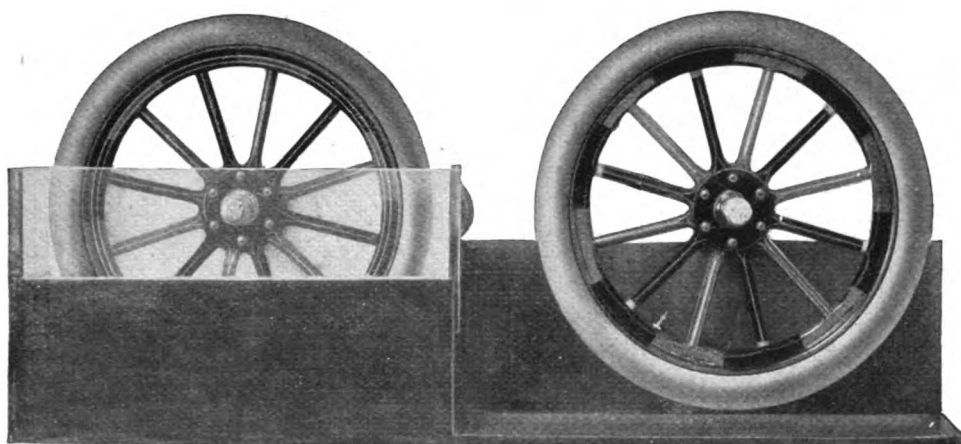
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*A feature of our exhibit at the Show this year will be a novel representation of automobile bodies in various colors.*

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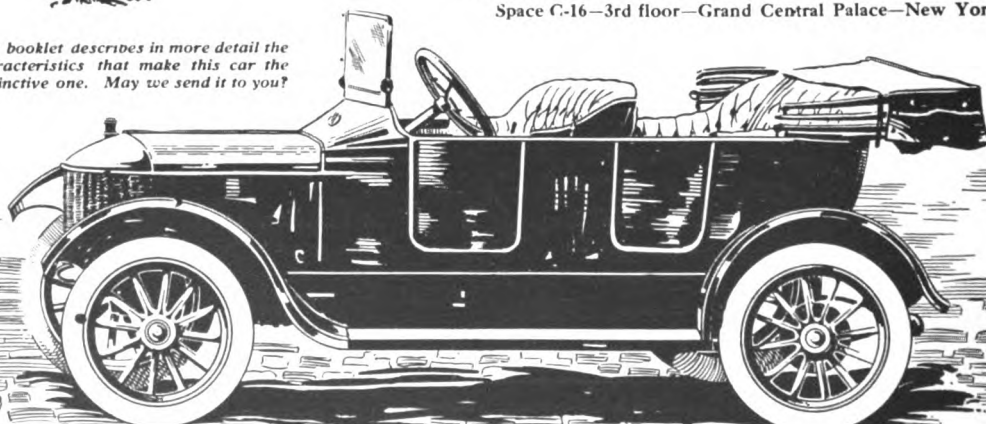
THE CAMERON 4 has been constructed with a principle in view not a price. A MODERATE PRICED CAR—STURDY, COMFORTABLE, POWERFUL YET SIMPLE AND ECONOMICAL IN OPERATION.

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Our booklet describes in more detail the characteristics that make this car the distinctive one. May we send it to you?





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When a man goes to buy a car he knows that the Overland possesses greater horsepower, a longer wheelbase, larger tires, a roomier and more comfortable tonneau, and better equipment than any car costing less than \$1200.

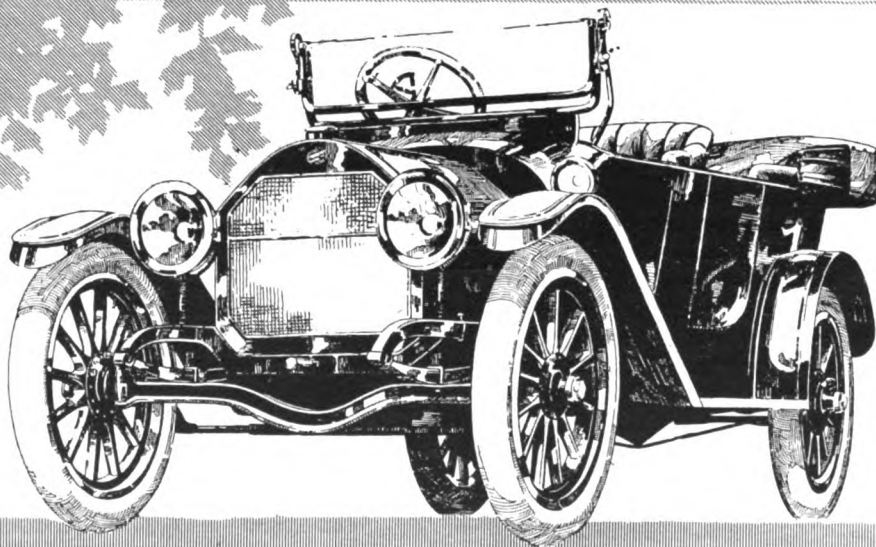
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Electric head, side, tail  
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35 Horsepower motor  
114-inch wheelbase  
Three-quarter floating  
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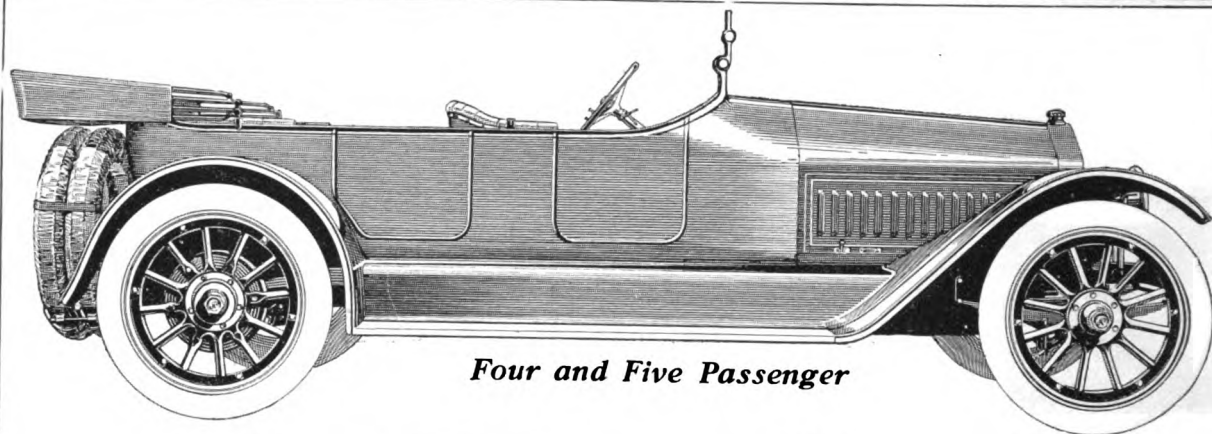
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## Brief Specifications---National Six

Motor, six-cylinder,  $3\frac{3}{4} \times 5\frac{1}{2}$  inch, cast en bloc. Tire pump, integral part of motor. Clutch, self-contained aluminum cone. Starting and lighting, electric two unit system. Transmission, sliding gear selective type, three speeds forward, one reverse. Gauge 56 inches. Oiling, crank case constant level, force feed, with gear driven pump. Ignition, high tension, dual magneto with storage battery. Tires  $36 \times 4\frac{1}{2}$ . Firestone demountable rims. Air pressure gasoline feed, generated by small pump in crank case. Capacity 23 gallons.

Automatic carburetor. Two sets of brakes on 16-inch rear wheel drums. Bevel gear drive through straight line shaft with universal joints and torsion member. Full floating rear axle. Left side drive. Access all four wide doors. Single lever in center controls all speeds. Half elliptic springs, front, special National construction, rear.

Equipment:—Top complete with side curtains and boot, ventilating rain vision wind shield, extra Firestone rim, electric lighting and starting systems, 12-inch double bulb electric headlights, electric license tail light, Warner speedometer, electric horn, tools and jack.

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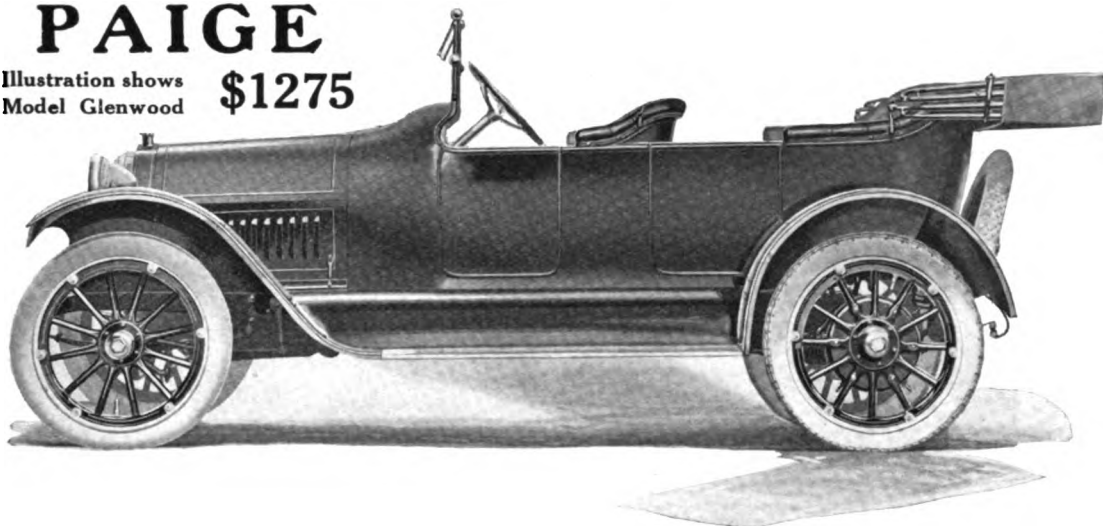
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Model Glenwood**\$1275**

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You won't be able to find out all you ought to know about a car from looking it over at the show, for there are certain factors of the most vital importance to every prospective car purchaser that will not be a part of the exhibits.

We mean the capitalization—the indebtedness—the plan of organization and the financial policy of the company building the car.

Yet the dealer and the buyer should inquire into these things. They are of the utmost importance to every buyer who is attempting to select the greatest value for his money. In the last analysis these factors almost alone determine the comparative value of the various makes of cars.

You will see Paige motor cars exhibited. You will see that they are better designed, better equipped, better built cars than are sold at anywhere near Paige prices. You will see such features in Paige cars as the multiple disc cork insert clutch, silent chain drive for motor shafts and a score of other equally high grade features. You will see a complete electric lighting and starting system on the Paige "25" selling at \$975—the first car with this equipment at less than a thousand dollars. And you will realize that Paige cars offer an extra value for the money.

But to know why the Paige Company is able to produce so much better cars for the money than competing manufacturers you must know the Paige organization.

Inquire into the capitalization of the Paige Company and you will find that the total capital

stock amounts to just \$250,000. This is all the stock that must earn dividends.

The Paige stockholders are satisfied with normal earnings on this investment and insist that all profits over and above this earning be put back into the car.

There is not a dollar's worth of bonded indebtedness to drag the Paige Company down.

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All these factors play a part toward building up Paige extra value.

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You will find the famous Paige "36" touring car and roadster selling at \$1275. Also three closed body types ranging from \$1850 to \$2250. And the Paige "25" touring car and roadster at \$975.

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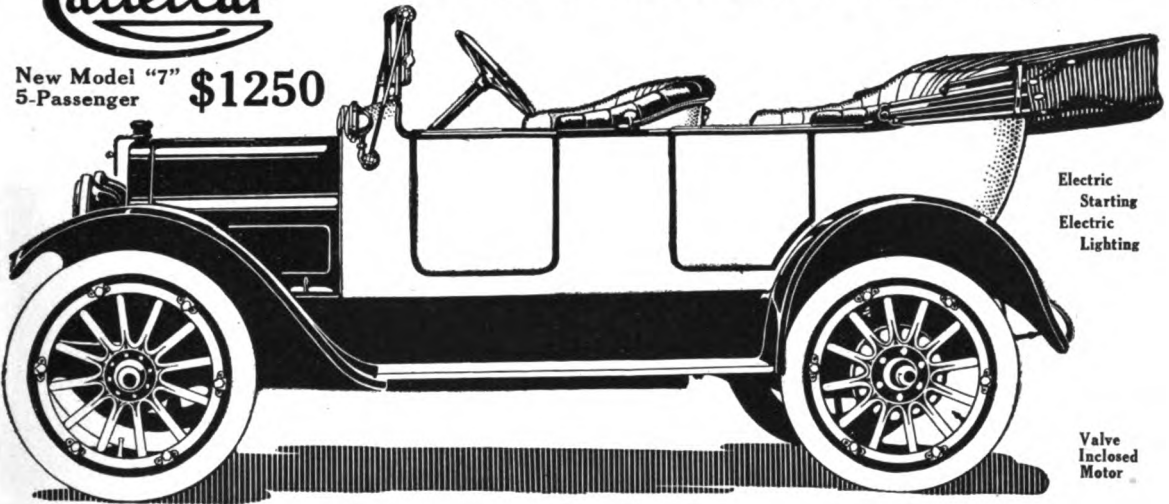
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New Model "7" \$1250  
5-Passenger

"The Car With the Gearless Transmission."



Electric  
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## The Cartercar Gearless Transmission— Twelfth Year of Success

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**Second**—Its flexibility. It gives you hundreds of speeds instead of three or four; permits you to go from high directly into reverse without injury to the mechanism. The operation is merely moving a lever forward for greater

**There Are Now Six Cartercar Models—Including Two**

We are proud of our Cars and naturally we want to tell you about them. To begin with, we will tell you about the newest model.

Model "7" is produced in two designs, full 5-passenger, fully equipped, including electric lights and starter, demountable rims with one extra. Model "7" roadster is equipped the same, is on the same chassis, seats two people, has large space in rear for luggage, extra tires, etc. Each model "7" sells for \$1250 and is one of the best automobile values ever offered to the public. Ask to ride in a model "7".

**A CARD WILL BRING OUR NEW CATALOGUE.**

speed and pulling the same lever back to reverse the car.

**Third**—Its power. The tremendous leverage obtained enables you even to climb 50% grades should you so desire. It also proves its worth on a steep hill, in a sandy road or on a crowded street, for it permits the car to roll along on any of the low speeds without racing the engine.

The roomy bodies, the long wheel base, the perfect upholstery, the superb finish, the big tires, the electric starting and lighting all controlled from the driver's seat, all these add touches that go to make the Cartercar the most satisfactory all around car on the market today.

It doesn't make any difference how many other makes of cars you have owned, or how exacting you are, or how hard you are on a car, if you purchase a New Model "7" Cartercar at \$1250, you are sure to be more than pleased.

**There Are Now Six Cartercar Models—Including Two New Ones—Will You Let Us Tell You About Them?**

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**The groove in the plug is the**  
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**itself, making an absolutely**  
**hermetically sealed joint.**



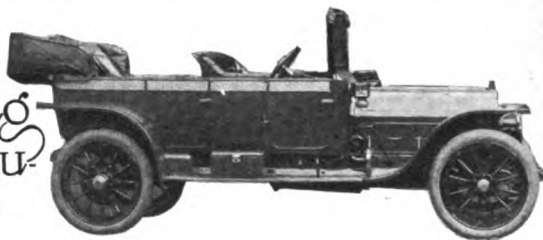
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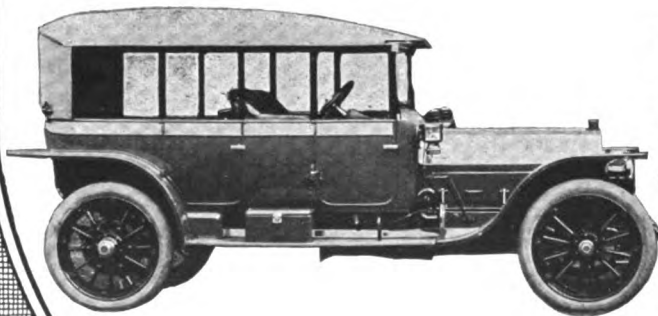


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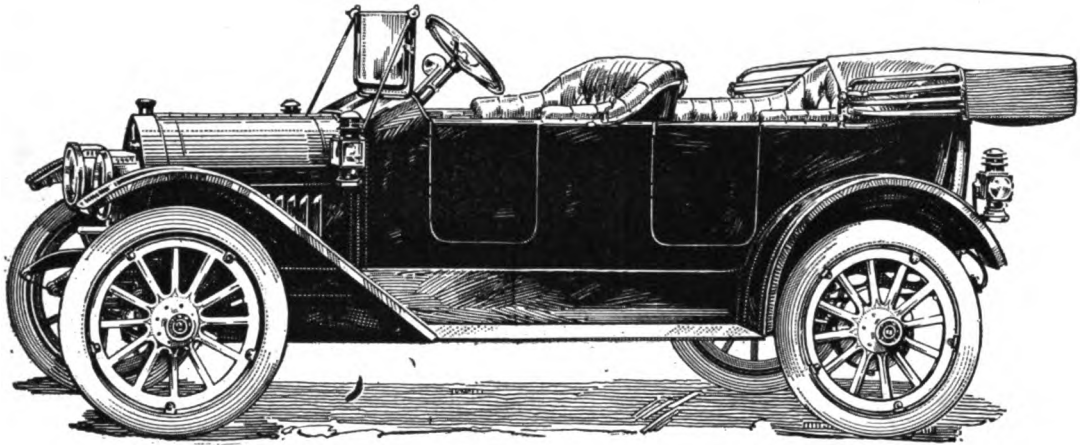
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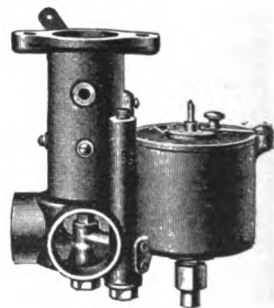
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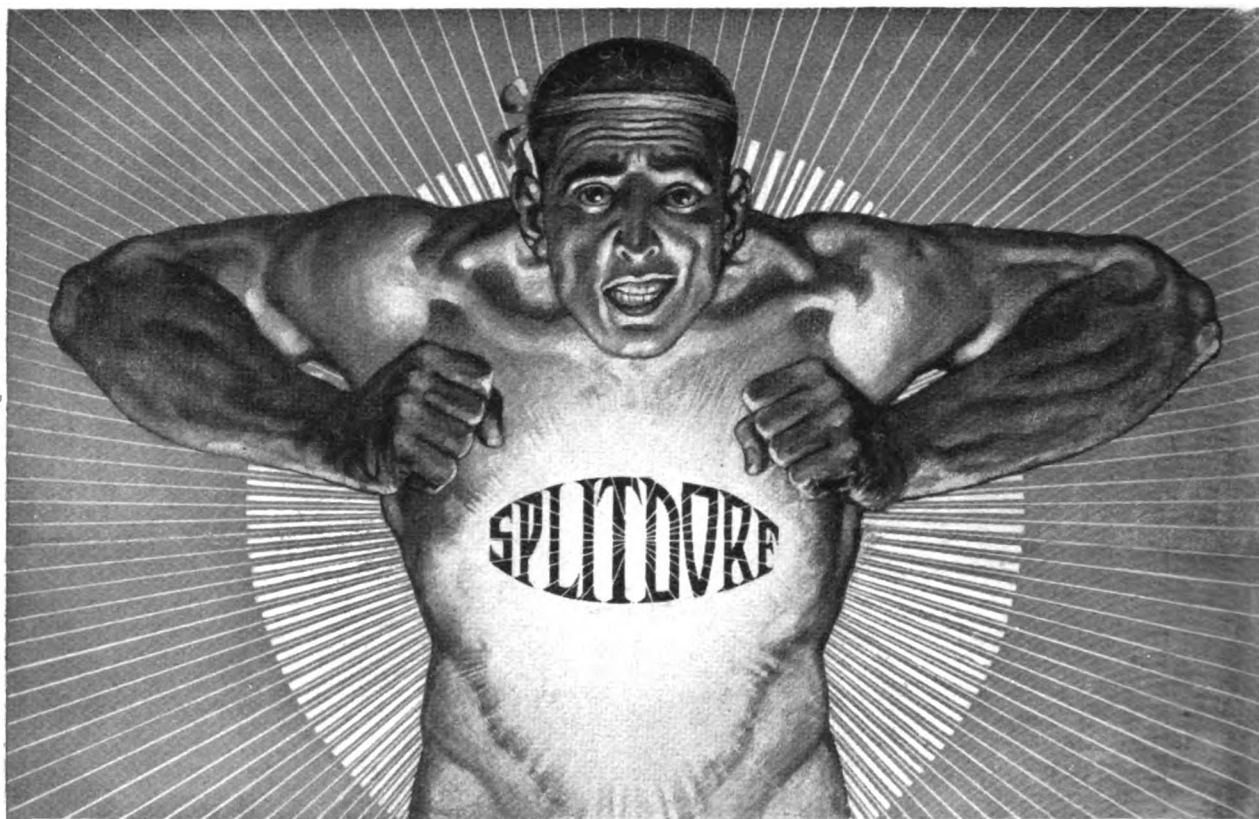
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### The car you have long wanted

*More Power—More Flexibility—More Economy—More Silence*

**Guaranteed fifty brake horsepower** The car of the future is here today—a guaranteed fifty brake horsepower “Four” as powerful and as flexible as any “Six”—a big, roomy five-passenger car, ironed for two auxiliary seats, with an electric starter that starts each and every time. The Moline-Knight will be a delightful surprise, with its perfect, graceful, smooth streamline body and foreign air. Moline upholstery quality has been embodied throughout.

**The car of the future will not have poppet valves** The old poppet valve has outlived its usefulness because high compression, large valves, strong springs and precipitous cams are necessary in the poppet valve engine to get great power and high speed. Here is a weakness the poppet valve will never be able to overcome. In the Moline-Knight there are no valves to clog or grind—no cams, no springs, no timing gears to get out of order.

**Everything you have desired** Full floating rear axle, 128-inch wheelbase, selective transmission, half elliptic rear springs of unusual length,

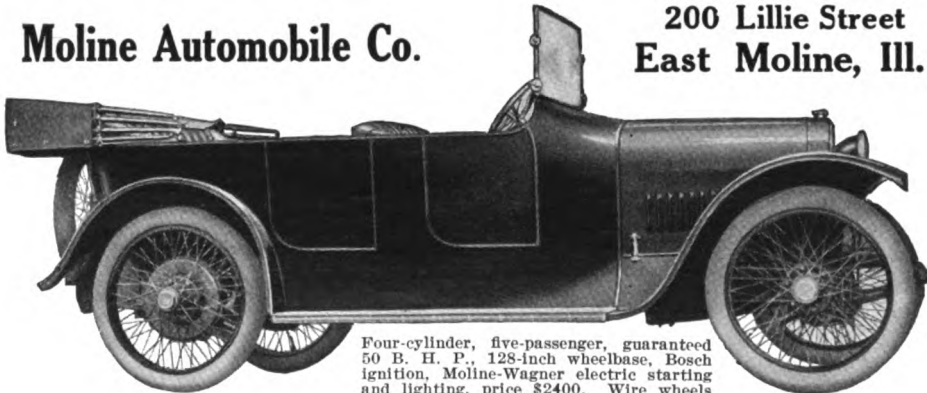
Truffault-Hartford shock absorbers, Bosch ignition, Schebler carburetor, Moline-Wagner electric starting and lighting, adjustable foot pedals, center control, left side drive, lubrication by force through hollow shaft, 36x4 1/2 artillery or wire wheels, Firestone demountable rims, 18-gallon gasoline tank in rear, finished in blue-black, other colors optional with three weeks' notice. One-man Mohair top, cover and side curtains, automatic wind shield, electric horn, power tire pump, Warner 60-mile speedometer, Goodrich Unit Molded Tires, gasoline and oil gauge and speedometer, foot rail, robe rail, tire irons, complete set of tools, jack, tire repair kit, eight-day clock.

At least investigate—write today for our Advance Information Folder—learn the truth about motors.

**Dealers, if you can show us you are entitled to a Moline-Knight contract, write or wire us at once.**

**Moline Automobile Co.**

200 Lillie Street  
East Moline, Ill.



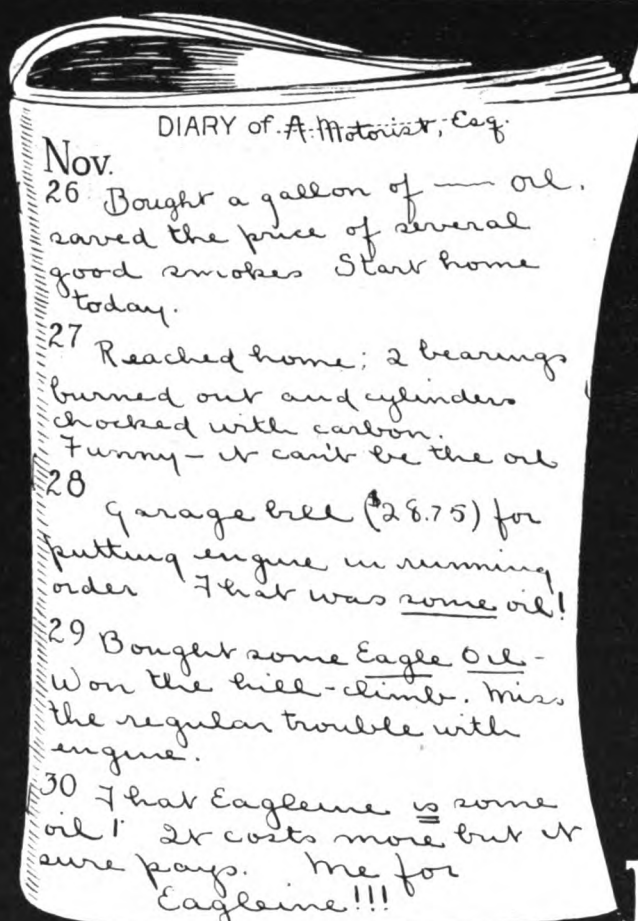
Four-cylinder, five-passenger, guaranteed 50 B. H. P., 128-inch wheelbase, Bosch ignition, Moline-Wagner electric starting and lighting, price \$2400. Wire wheels extra.

### The “Four” that makes the “Six” unnecessary

MOLINE-KNIGHT

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K  
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EAGLEINE

NO-KARBON  
CYLINDER  
OIL



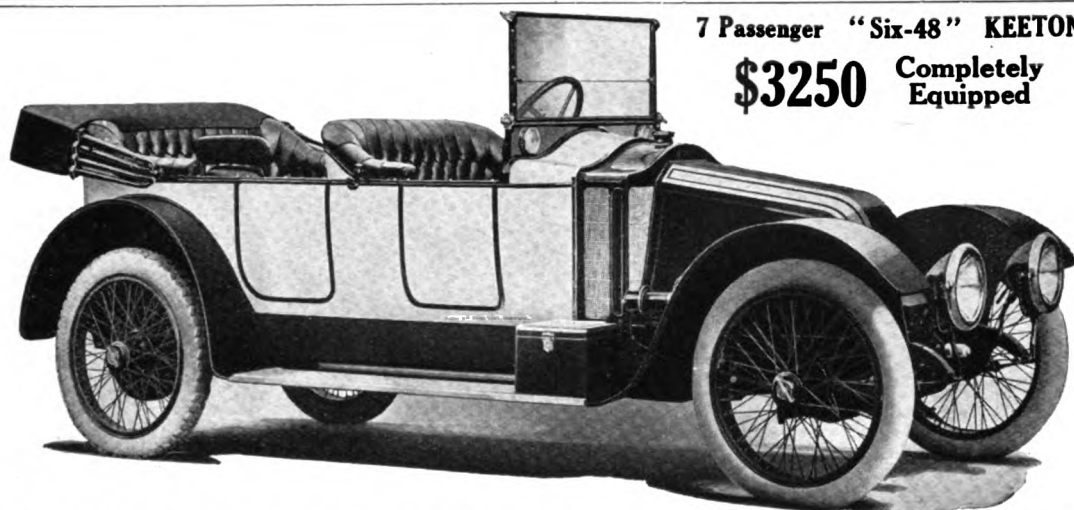
### Eagleine Oil is the Better Oil

Not because WE say so—but it has been proved so by actual tests. It produces LESS CARBON than any other oil we have ever tested, and at the same time is a PERFECT LUBRICATOR—this has also been proved by exhaustive tests.

It is the most satisfactory oil known to the automobile industry.

EAGLE OIL & SUPPLY CO.,  
104 BROAD ST. BOSTON MASS





7 Passenger "Six-48" KEETON

**\$3250** Completely Equipped

## KEETON THE TWO CARS THAT WILL INCREASE YOUR SALES CAR-NATION

The volume of your sales largely depends upon the attraction value of the cars you handle. Some cars feature power, some economy, some quietness, others speed, appearance, price, etc., but in no other car will you find these qualities blended in such harmonious proportions as in the new "Six-48" Keeton.

A limited number of these "distinctive" cars will be produced for the coming season and dealers will find it greatly to their advantage to get in touch with us at once.

### KEETON SPECIFICATIONS

Electric starting. Full electric light equipment. Six cylinders cast en bloc, large valves. Small bore, long stroke. All moving parts completely enclosed. Exceptionally powerful and flexible. Radiator at rear of motor in proper and protected position. Centrifugal pump and fly wheel fan insure ample cooling. Four speeds forward in transmission. Direct on 3rd—geared up on 4th. Left hand drive—

right hand control. Wire wheels—with extra detachable wire wheel. Long 136-inch wheel base—long springs, special alloy spring steel, nearly flat under load. Chrome Vanadian Gears and Shafts on imported annular bearings. Pressure gasoline feed. Very roomy and comfortable bodies. Best of foreign practice adapted to American road and touring conditions. Very complete and detailed equipment.

### PRICES F. O. B. DETROIT

2 Passenger Roadster completely equipped - **\$3250.00**

7 Passenger Touring Car completely equipped - **\$3250.00**

A full line of open and closed bodies. Interesting literature sent on request.

**\$495.00** **\$495.00**

## CAR-NATION

"The Car for the American Public"

## More Than a Cyclecar

The Car-Nation has all the features hitherto only found on large expensive cars, yet it is light, snappy, economical (25-30 miles to the gallon) and the price is within the reach of the great majority of buyers.

The Car-Nation is made of standard parts, every one of which has been time tried and proven by use in bigger cars costing \$1000 and over. Just think of what this means in every day service to an owner.

Read the specifications and go over them part by part with any car you can think of. The 4-cylinder block motor with 3 speed forward and reverse, selective type transmission and multiple disk clutch as a unit power plant—wire wheels. Left hand drive center control—V shaped radiator with a sloping hood and cowl—in fact every part is a "feature" in many larger cars.

DEALERS—We are now producing these cars and the territory is going fast. You can make a very advantageous connection by closing your territory for this line. Write or wire now.

See Our Exhibits at New York and Chicago Shows



2 Passenger "CAR-NATION" Plowing the Mud  
CAR-NATION SPECIFICATIONS

Unit Power Plant—Motor—4-cyl. en bloc 3½x3¾ "L" head—large valves and bearings. Very quiet and powerful. Ignition—Magneto—Fixed Spark. Lubrication—Constant Level Splash—Plunger Pump. Carburetor—Approved Type—very economical. Cooling—Thermo Syphon. V shaped radiator—adjustable belt driven fan. Clutch—Multiple steel disk type running in oil. Transmission—Selective type 3 speeds forward and reverse. One lever control. Drive—Bevel gear through concentric torque tube with one universal joint. Rear Axle—Semi Floating Type, Hyatt Roller

Bearings. Brakes—Emergency. Internal Exp. on 10" drum on rear wheels. Service external contracting on transmission shaft. Wheels—Detachable wire—30x3" clincher rims and smooth tread tires. Control—L. H. drive center control. Wheel base 104". Tread 48". Standard equipment—Horn—Head Lamps and Tail Lamp with set of tools.

### PRICES

Model A—2 Passenger Roadster - - - **\$495.00**  
Model B—2 Passenger Tandem Type - - - **\$510.00**  
Model C—4 Passenger Touring Car - - - **\$520.00**  
Extra Equipment—Top, \$25.00; Windshield, \$10.00

Manufactured by KEETON MOTOR CO., Detroit, U. S. A.

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# REVIEW NEW YORK Show Number



## January 10, 1914

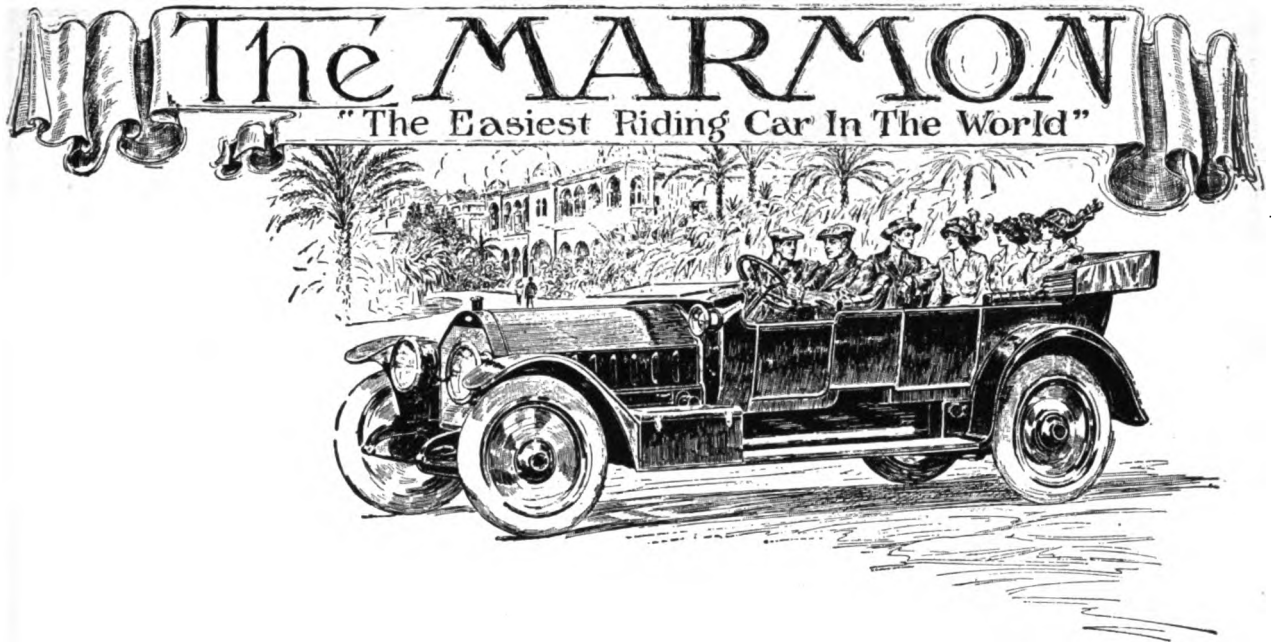
90 per cent. of the readers of the Journal are motor car owners—The men that constitute the market.

In this edition will be presented a complete resume of the New York Exhibition and a carefully prepared analysis of cars, parts and equipment that will be marketed during the year to come.

The Journal circulates in the field in which the greatest volume of business is done in America—where cars and equipment are being sold—it reaches the men who are buying.

**The Automobile Journal Publishing Co.**  
**TIMES BUILDING** **PAWTUCKET, R. I.**





Does it pay to put the very best of everything into a motor car or any other manufactured product? Does the public appreciate the untiring effort of the manufacturer to produce the best?

An emphatic answer to this question lies in the steady growth and present strength of this great institution. For more than sixty years it has followed the policy of producing the best at a fair price, and the American public has responded with generous recognition of honest value.

In motor cars, as in other high-grade machinery, this company may be depended upon now and in the future years to produce the very best that long experience, trained brains, fine workmanship and ample resources can bring forth, and to sell it at a price that will give the fullest measure of value to the purchaser.

*Inquiries to our factory or to the Marmon dealer in any city will be treated with the respect and consideration which the average purchaser of a high class car desires and expects.*

## The Marmon for 1914

In addition to the Marmon "Thirty Two," four-cylinder car, and the Marmon "Forty Eight," six-cylinder car, we are pleased to announce a new medium-size six-cylinder Marmon, model "Forty One," which will be exhibited first at Space B-1 at the New York Automobile Show in January.

Detailed information with specifications and prices may be obtained from dealers or factory.

## Nordyke & Marmon Co.

INDIANAPOLIS (Established - 1851) INDIANA



Sixty Years of Successful Manufacturing

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# The TIRES THAT STAND THE KNOCKS OF TIME CATARACT

4000 Mile Guarantee

## QUANTITY vs. QUALITY

In order to maintain their grip on the tire market the so-called standard manufacturers have today been forced by the tremendous increase in the demand for their product to substitute quantity for quality. The year 1914 will witness a tire war among these companies such as never before seen in the business world. Price cutting with its ultimate results—poor product—will be the effect. The burden as usual will fall upon the consumer.

## CATARACT QUALITY

Notwithstanding this condition there is a demand for quality goods. Tires that are built right, that look right and that perform right. Tires made from the finest of rubber and fabric by the most skilled workmen. **SUCH ARE THE CATARACT TIRES.** A little higher in cost price—but a great deal lower in mileage price.

*May we not send you our booklet  
on CATARACT tires and policy?*

**WHEN YOU TIRE OF OTHERS—  
RE-TIRE WITH US**

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PROVIDENCE, R.I.

FACTORY: WOOSTER, OHIO.

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car that made  
good in a  
day

STUTZ—the  
car that made  
good in a  
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## Sturdy Stutz Proclaimed Champion

The year 1913 was a period of splendid achievement for the Sturdy Stutz. It saw the Stutz outclass the most carefully built cars in the world, in the most severe tests ever attempted.

### A year of triumphs

Since July 5, 1913, the Stutz has won seven consecutive road race victories. In these seven races, totaling 1847.86 miles of service at an average rate of 70 miles an hour, the performance of the Stutz has been the most consistent ever seen on American tracks.

The triumph of the Stutz comes from building into the car the utmost stamina and endurance, with just the right balance between weight and power.

### Built to endure

The years of gruelling service on the race tracks and in private use, which the Stutz has undergone, have been an education to our designers and mechanics. From these tests, they have learned just what must be put into a car to make it a permanent success.

As a result you get perfection of form as well as mechanical perfection when you buy your Stutz. Its stamina, sturdiness, beauty, roominess and comfort will please you always.

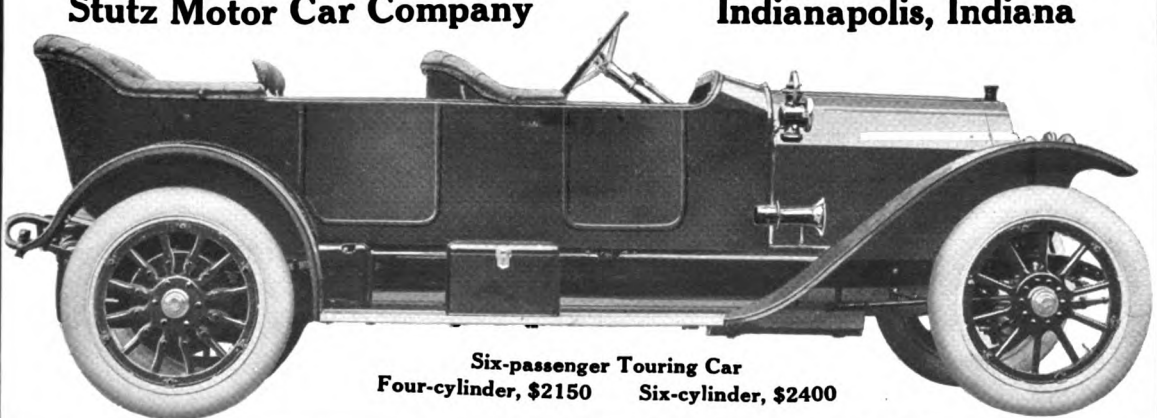
### See the Stutz at the shows

The Stutz will be on exhibition at Space B-7 First Regiment Armory, Chicago and Space B-10 Grand Central Palace, New York. Take the time to look it over carefully. You should know the facts about this truly remarkable car. Write for our new illustrated catalog, No. A-5, Series E.

**Dealers** We still have a little desirable territory open and an interesting proposition to make responsible dealers. Write or wire.

**Stutz Motor Car Company**

**Indianapolis, Indiana**



Six-passenger Touring Car  
Four-cylinder, \$2150      Six-cylinder, \$2400

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# AUTOMOBILE ELECTRIC LIGHTING SPECIALTIES

For the Automobile Owner & Manufacturer  
Who Wants *SERVICE* For His Money.

## Combination Dash And Trouble Lamp With Extension Cord



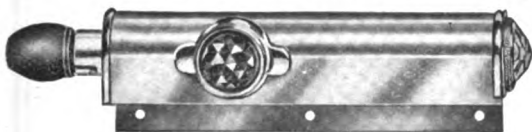
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**Style D  
Combination**



**Extension Cord**

**Rear  
Number Lamp**



We are the pioneers of this country in the manufacture of **Automobile Electric Lighting** equipment—We have passed the experimental stage—and today sell only equipment that is perfected.

Our Electric Lighting Equipments are standards—they have been selected by many of the leading automobile engineers of this country and installed on every car as part of its regular equipment—

CULVER-STEARN'S Electrical Products never become loose at the sockets—never a short circuit—no breaking of current—always working when wanted—and will wear indefinitely.

WE HAVE ILLUSTRATED TWO OF OUR SPECIALTIES  
WHICH ALWAYS DELIGHT THE PURCHASER.

### Style "D" Combination Dash and Trouble Lamp (Patent Applied For)

With Extension Cord

The only combination Dash and Trouble Lamp on the market and a most practical and satisfactory article.

In less than one minute it can be disconnected from the dash and converted into an ideal trouble lamp.

Constructed of the best of materials, perfectly fitted, and finished in a beautiful bright nickel.

It takes only a few moments to install this lamp on any car—any novice can do it—may be used with magneto or battery.

Style "D" complete with 2 C. P. 6 V Mazda bulb, 10 ft. of cable and either flush or projecting dash connector. List \$3.00 each.

### TO MANUFACTURERS AND THE TRADE

We can promptly make to your order any  
Electrical Equipment, or will originate and manufacture any special parts desired—

### Style "K" Rear Number Lamp

This Lamp, as its name indicates, is designed to meet a demand for a good lamp that will really illuminate the rear number plate. This lamp should be placed directly over, or attached to, the rear number plate, and the diffusion of light is such that the entire number plate can be easily read.

While this Lamp is not designed for a Tail Lamp, it does carry a small but powerful red lens.

This Lamp is an absolute protector to automobile owners living in those states which impose a penalty if numbers are not properly lighted—a novice can install it in a few moments.

This Lamp is made of the very best grade of materials, and fully guaranteed.

Style "K" complete with Mazda Bulb, list \$3.50 each.

### OUR NEW 1914 CATALOGUE

is ready for mailing—It contains information of the most desirable Electrical Equipment on the market today—mailed upon request.

### Special Notice To Car Owners

We want every automobile owner to be able to get our goods promptly when they are wanted. If your dealer does not have C-S goods in stock—write us and we will see that your order is promptly filled.

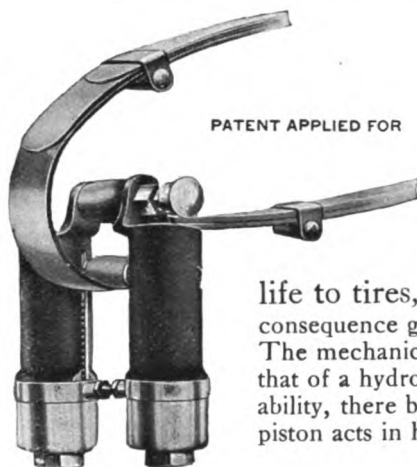
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WORCESTER, MASS. DETROIT, MICH.

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# J. H. S. SHOCK ABSORBERS



PATENT APPLIED FOR

are a revelation as well as a revolution in spring suspension.

Their sensitiveness of action **AUTOMATICALLY** takes up and destroys jars and jolts, either heavy or light, and to the occupant of a car it seems like riding on air—fairly floating through space.

Vibration is eliminated, thus giving long life to tires, motor, transmission and other components. In consequence greater speed is possible, as the car does not tend to skid or roll. The mechanical principle of the J. H. S. Shock Absorber is as scientific as that of a hydro-carbon engine. A cylinder and piston are used to insure durability, there being no fragile parts to wear or easily get out of order. The piston acts in harmony with coiled springs which destroy all shocks.

**PRICE—\$15.00 AND \$25.00 A PAIR**

**ATTRACTIVE OFFER TO FORD OWNERS**

**30 DAYS'  
FREE TRIAL**



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GUARANTEE**

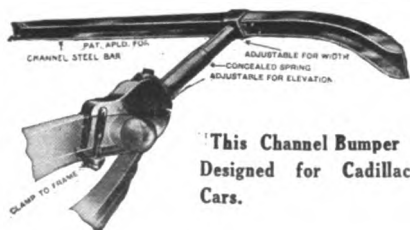
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Designed for Cadillac  
Cars.**



**DIAMOND BUMPER  
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**Liberal Discounts**

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# One Million Cars Prove the Truth About Lighting

Most of them, over four-fifths of the million, are gas lighted.

Those that are lighted with electricity are contributing even stronger proof why gas lighting is more economical, most efficient, just as convenient and far safer.

Investigate carefully before you buy your new car. It will save you time, money and trouble if you use the coupon below.

## Economy

Absolute proof in actual tests and service show that electric lights cost you five times more than Prest-O-Lite. Evidence awaits you. Get it.

## Efficiency

The candle power of the electric lamp bulb is about half that of the naked flame of gas lighting. If you want only a dazzling beam, half a mile down the road, you can get it with a parabolic reflector. But experienced drivers prefer gas lamps that show the road immediately in front of the car **where it is needed.**

*The coupon brings added proof. Use it!*

**DEALERS** Every day we are hearing from a few practical dealers, who have sunk profits in trying to make electric lighting equipment live up to the maker's claims. We have a special message for the wise dealer who can see ahead of today—who is figuring on the future. Ask for it.

**The Prest-O-Lite Co., Inc.** 226 SPEEDWAY  
INDIANAPOLIS, IND.

Exchange Agencies Everywhere  
(Contributor to Lincoln Highway)

## Convenience

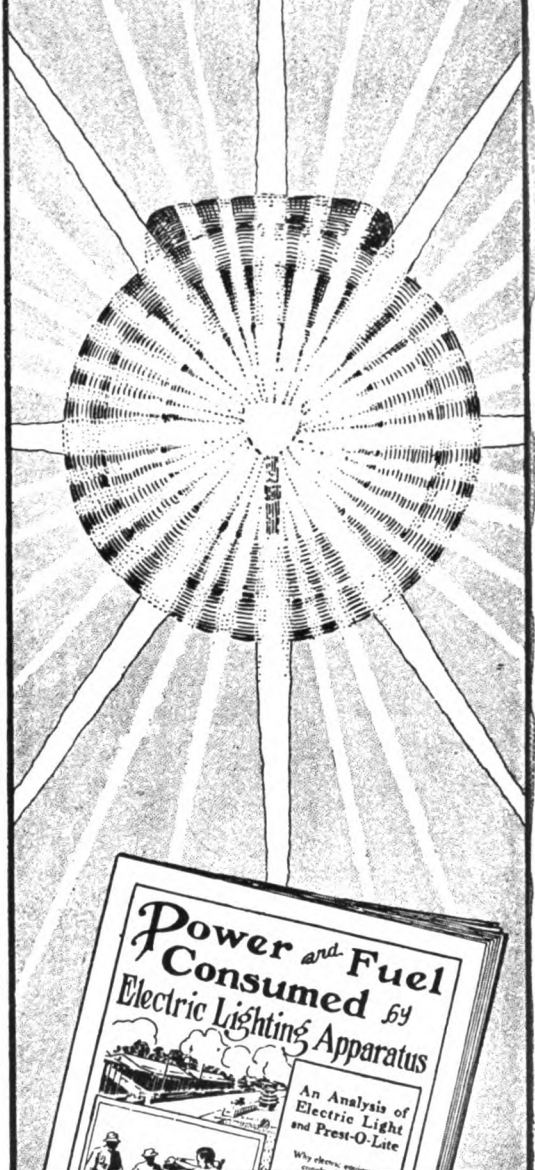
With the Prest-O-Liter and Automatic Reducing Valve, gas lighting offers every "push-the-button" convenience. You can light or extinguish any or all the lamps on your car from the seat.

## Safety

Here is a quotation from one paper—

"Seventy-five per cent. of the collisions that have taken place in the night time in San Francisco of late, can be laid to the glare of the electric headlights of the modern car."—Pacific Motor, San Francisco.

# Prest-O-Lite



## USE THE COUPON!

The Prest-O-Lite Co., Inc.,  
226 Speedway, Indianapolis, Ind.

Please send the Facts about ALL  
Lighting Systems to—

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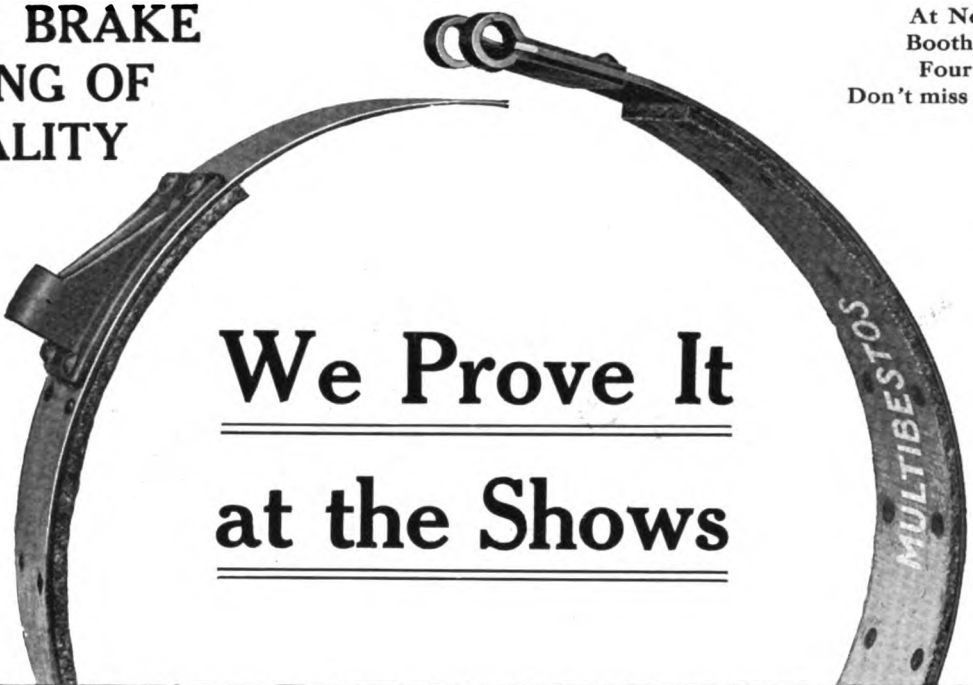
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# THE BRAKE LINING OF QUALITY

At New York  
Booth No. 175  
Fourth Floor  
Don't miss seeing it



## We Prove It at the Shows



THE GRIP  
**MULTIBESTOS**  
BRAKE THAT GRIPS LINING

Every Salesman of brake lining has a few stock phrases that he uses continually in arguing for the quality and merit of his particular brand. Heat resistance; coefficient of friction; extreme durability---these and many others are among the features which are spoken of so often, and at times so loosely. One calls his "the original"; another flatly declares his "the best".

We have made several claims ourselves and

now that we have the opportunity we mean to prove these claims and back up our widest statements with substantial proof.

At all three of the big shows we will have on exhibition a mechanical device which will be driven by a friction wheel made of Multibestos. There will be a brake drum attached and the band will be lined with Multibestos. By this device we can show exactly what Multibestos will do.

There will be no guess-work about it---no loose statements; but there will be definite and absolute proof that every feature which goes to make a good brake lining is found in the highest degree in MULTIBESTOS.

C. D. Schmidt, 276 Canal St. New York, N. Y.  
F. E. Sparks, 1430 Michigan Blvd., Chicago, Ill.  
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Framingham, Mass.

When Writing to Advertisers, Please Mention The Automobile Journal.





**A VISION**  
of your car,

smashed on the  
slippery curve  
ahead—

*You* have neglected to put on  
Weed Chains.

*You* anxiously view the slippery  
curve ahead and have *a mental*

*picture of your car smashed against a rock.*

Why nurse anxiety and coax calamity—why take such chances  
when you know

# Weed Anti-Skid Chains

## *Absolutely Prevent Skidding*

*No other device* has ever  
been invented that takes the  
place of Weed Chains. All  
kinds of "make-shifts" have  
been tried—useless and worth-  
less all. The *real value* of  
Weed Chains has been proven  
so often and so satisfactorily  
during the last ten years that  
there is no room for argument.

They are slipped on in a  
moment without a jack. *They*  
*don't injure tires* even as  
much as one little slip or skid.  
*They never fail* in an emer-  
gency and take up hardly any  
space when not in use.  
*Send for Booklet proving the*  
*efficiency, economy and nec-*  
*essity of Weed Chains.*

*Sold for ALL Tires by Dealers Everywhere*

**Weed Chain Tire Grip Co.,**

28 Moore Street - - - - - New York

*Manufactured for Canada by*

Dominion Chain Co., Limited—Head Office: Shaughnessy Bldg., Montreal, Can.



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# THE AUTOMOBILE JOURNAL

VOL. XXXVI, No. 10

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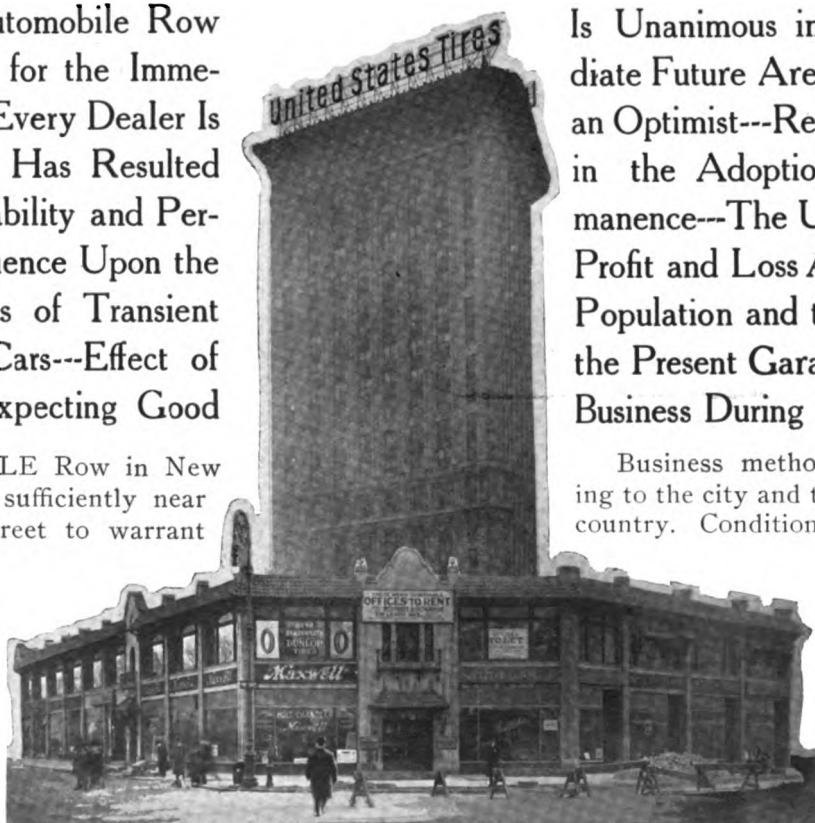
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## OUTLOOK FOR BUSINESS IN NEW YORK.

**Broadway's Automobile Row That Prospects for the Immediate Future Are Exceptionally Promising and Every Dealer Is an Optimist---Reorganization of Sales Methods Has Resulted in the Adoption of Policies Making for Stability and Permanence---The Used Car Problem and Loss Account---Dispopulation and the Practise of Shopping for Cars---Effect of the Present Garage Situation---Reasons for Expecting Good**

**A**UTOMOBILE Row in New City is sufficiently near Wall street to warrant

the assumption that the dealers in that centre are in a position to judge of the possible effect of the "Market" upon the sale of motor cars and accessories. If it be found that the men representing the industry in New York City are optimistic concerning the immediate future, it ought to follow that the conditions in this respect throughout the rest of the country are even more reassuring.



**Group of Car Agencies at Broadway and 59th Street, and the United States Rubber Building—The Heart of New York City's Automobile District.**

**Is Unanimous in the Opinion that Prospects for the Immediate Future Are Exceptionally Promising and Every Dealer Is an Optimist---Reorganization of Sales Methods Has Resulted in the Adoption of Policies Making for Stability and Permanence---The Used Car Problem and Loss Account---Dispopulation and the Practise of Shopping for Cars---Effect of the Present Garage Situation---Reasons for Expecting Good**

Business methods vary according to the city and the section of the country. Conditions which must be

met in one commercial centre may not exist in others. Policies which will apply to one line cannot be worked successfully with another. New York

presents certain problems that are unknown in some sections. It will be the object of this discussion to report the result of an investigation of the situation in that city, and it will be un-





**The White Company's Branch, Broadway and 63rd Street.** derstood that the record is that of actual conditions as revealed by personal interviews with men representing every branch of the industry in the Metropolis.

#### Reorganization of Sales Methods.

Let it be stated at the outset that the sales end of the business in New York has been very largely reorganized during the past year. By this is meant that the men engaged in the distribution of cars and accessories have adopted systematic methods tending toward a more careful supervision of details, so that it shall be possible at all times to determine the condition of the business and its several departments. With this has come a determination to educate the purchasing

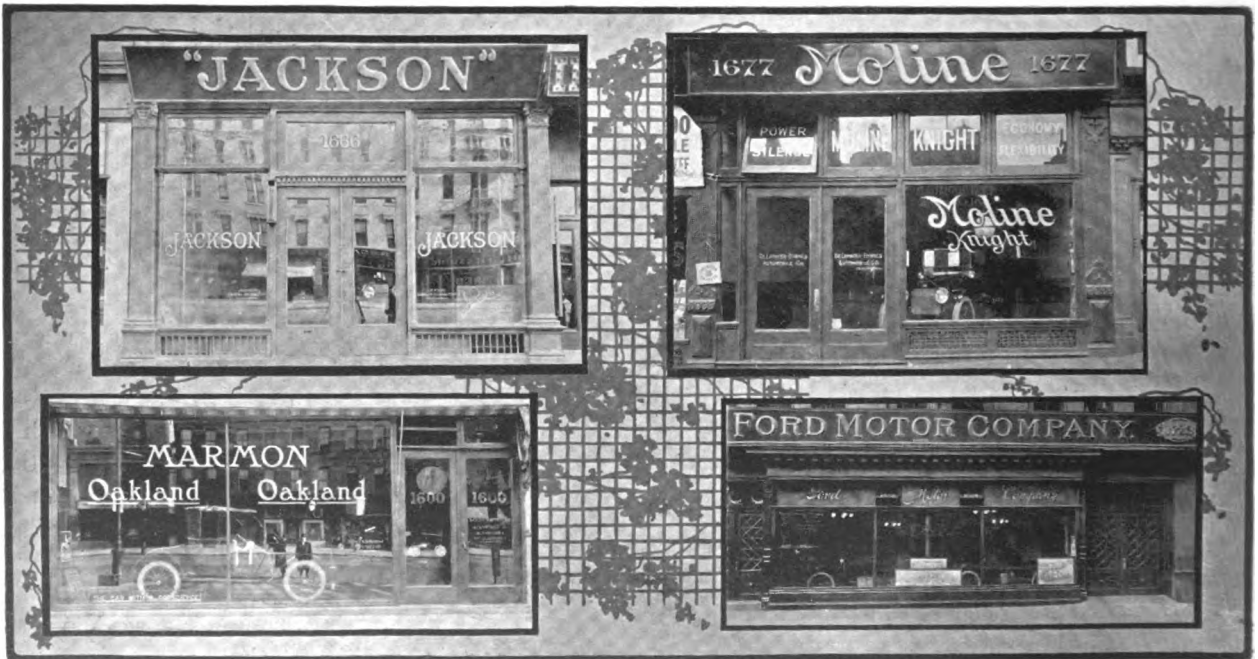
public to the necessity for considering each transaction on a strictly business basis.

#### Early Days Recalled.

Times have changed very materially since the days immediately preceding the organization of the National Association of Automobile Manufacturers, now the Automobile Chamber of Commerce, a little over 14 years ago. At that time the number of agencies could be counted without going far beyond the fingers of one hand. Chas. E. Miller's establishment on 38th street was the centre of New York's Automobile Row. Mr. Miller is practically the only New York dealer of that period who is still in business in that city, although others have graduated into the manufacturing end of the industry.

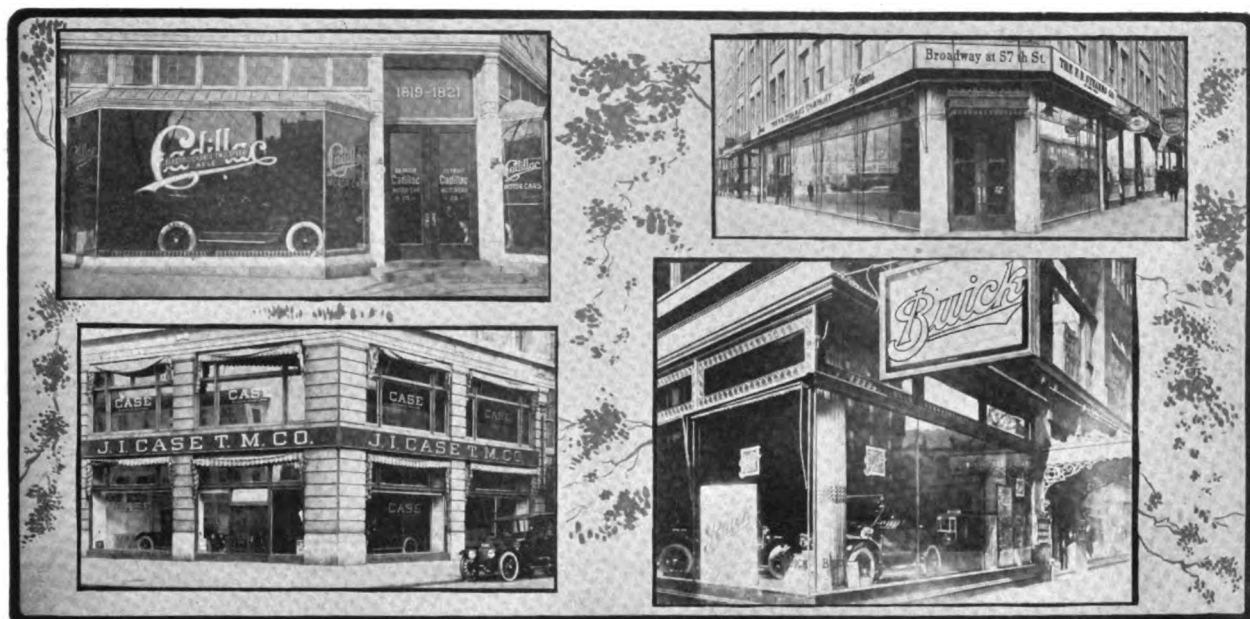
Mr. Miller's position in the industry always has been rather unique. His name is known today in every section of the globe as that of a dealer, manufacturer, jobber, exporter and importer of accessories, supplies and fittings. Upon entering his headquarters at 97 Reade street, the first object to attract special attention is a framed membership certificate, numbered 3, in the National Association of Automobile Manufacturers, and the question at once arises as to the presence of an accessory man in an organization of automobile manufacturers.

Long before John Wanamaker first exhibited Mobile steam cars in his New York department



**Upper Left, Jackson Eastern Distributors, Jackson; Upper Right, DeLamater-Byrnes Company, Moline-Knight; Lower Left, Sidney Bowman Automobile Company, Marmon and Oakland; Lower Right, Ford Motor Company, Ford.**





Upper Row, Detroit Cadillac Motor Car Company, Cadillac, and F. B. Stearns Company of N. Y., Stearns; Lower Row, J. I. Case Threshing Machine Company, Case, and Buick Motor Company, Buick.

store in the latter part of 1898, Chas. E. Miller was an important factor in the American automobile industry. It was while he was handling bicycles and bicycle accessories in a national way that Mr. Miller became interested in the horseless carriage. It will be remembered that many pioneer motor vehicle men were graduates from the bicycle industry, and their acquaintance with this establishment led them to commission Mr. Miller to search out various parts that could be adapted to the new product, such as steam boilers, rear axles, and in fact almost every part entering into the assembly of the car—for the automobile manufacturer of those early days was most assuredly an assembler.

#### Situation Never so Promising.

Detroit may be the heart of the automobile industry today, but New York shared honors with Boston in the beginning, and this fact had its influence on the selling of cars. One of the oldest New York dealers is Theodore E. Schulz, now sales manager for the Sidney Bowman Automobile Company. He has been selling motor vehicles in the Metropolis for 13 years, and he has witnessed all of the changes in methods and conditions during that time. He holds that the situation never looked so promising and that the stability of the industry never was better assured.

#### Need for Efficient Salesmen.

When the industry was young, and before the practicability of the horseless carriage was established, it was deemed necessary to adopt sales methods that, whatever the results at the time,

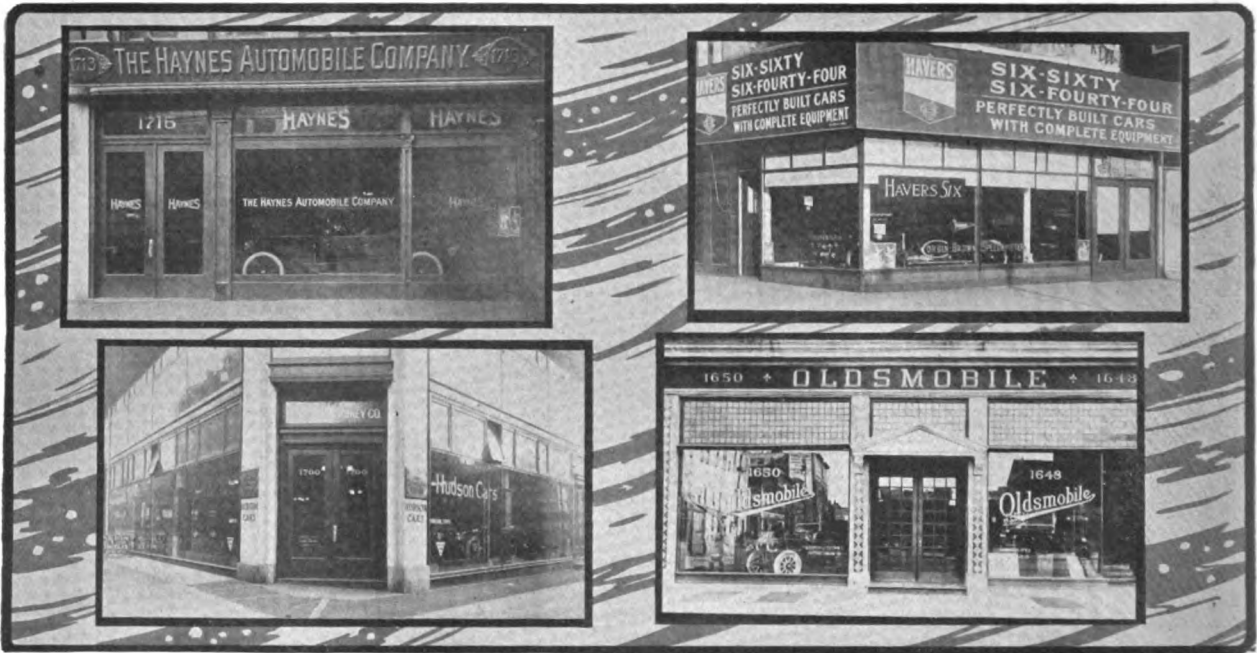
cannot be regarded today as satisfactory. Many men engaged in the production of cars realized the importance of getting these machines in the hands of users, for it was believed that only by constant use could their practicability be determined. There is no disposition to interpolate a history of the automobile industry, or of its sales methods, but this reference to the past appears necessary in order to indicate the desirability of the changes which have been brought about on the part of New York dealers—and it may be added that these changes have been adopted much more generally by the dealers in that city than in some other sections.

Mr. Schulz considers that the most important



Flat Automobile Company and Kelly-Springfield Tires.





Upper Row, Haynes Automobile Company, Haynes and K. C. Pardee, Inc., Havers; Lower Row, A. Elliott Ranney Company, Hudson, and Cutting, Larson Company, Oldsmobile.

condition with which the New York dealer must contend today is that of securing efficient salesmen, and with this opinion many others agree. The usual practise in that city has been to pay the salesmen a stated salary plus a commission on each sale, this commission being based upon the amount of cash received. The subject of trading will be taken up in more detail as this discussion progresses, but it is sufficient for present purposes to state that this is a very serious problem in the Metropolis, as elsewhere.

#### Defects of the Old Plan.

The plan was considered a very satisfactory one, until systematic study revealed its shortcomings. Many dealers, in going over their

books at the close of the year, were somewhat surprised to note that, although sufficient business had been done to indicate a satisfactory profit, there was a deficiency. As a result there appears to have been a general awakening on the part of those in charge of the several sales departments, each working independently, and inquiry reveals that a very large majority have devised good, working systems to determine the actual value of each salesman to the establishment with which he is connected. These systems, no matter by what specific method, invariably show just how much profit resulted from each individual transaction. For example: In one instance, the salesman with the best showing with respect to number of sales covering a given period had cost the firm some \$750 in losses on these sales, while the man who had sold the fewest cars had netted a profit to the house very nearly as large.

#### Training Experienced Men.

It might be assumed that one of the results of this systematic study of the question would be that several salesmen would soon be in a situation to accept new positions elsewhere, but the reorganization plans contemplate such action only where it appears absolutely necessary. It has been the opinion of those responsible for the success of the sales departments that best results could be obtained by retaining the services of experienced men and educating these men to the new order of things. For this purpose, weekly



The R. & L. Company, Garford Cars and Trucks.



meetings are held, at which specific details of the business are considered from every aspect.

#### The Used Car Problem.

Some dealers maintain that from 80 to 90 per cent. of their sales involve the second hand problem. A large majority hold that it is absolutely impossible to do business without trading. A few declare that they positively will not trade. Practically all of those in the last named class avoid the necessity for trading, by maintaining a used car department as a separate institution, by which the second hand machine is sold for a customer without charge.

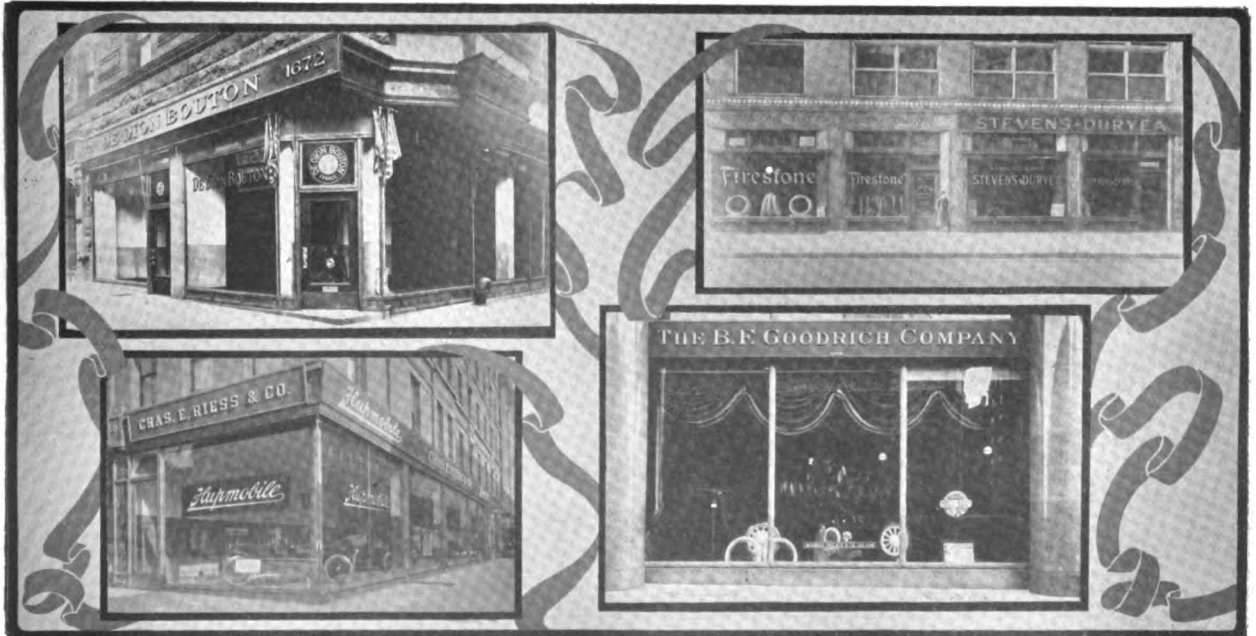
It is the question of allowance on the old machine which enters so largely into the matter of salesmanship, with that majority which believes it to be a necessary evil. Several plans have been tried. It is realized, or at least it is beginning to be realized, that the man who enters a salesroom with a second hand car proposition often is a much better salesman than the man with whom he is seeking to do business. That the temptation to make a sale many times outweighs the salesman's better judgment is evidenced by the showing reported above. The plan most generally in vogue today is that of asking the superintendent of the service station to place a value on the used car offered for trade and limiting the salesman to that figure.

Of course, there are dealers in New York, as there are in every other city, who do not strictly



Harry S. Houpt, Inc., Losler Agency.

adhere to this plan, although professing to do so, but they are decidedly in the minority. The whole subject has been under discussion in conference a number of times and the dealers themselves have come to the conclusion that more satisfactory results can be obtained individually. By this is meant that those men who believe in the necessity for establishing their business on a basis that shall endure, have decided upon a definite course with respect to this matter, and are permitting others to take such steps as they desire. These men are confident that it is impossible to continue long in business in New



Upper Row, E. Lascaris, De Dion-Bouton; Firestone Tire & Rubber Company, Firestone Tires, and A. G. Spaulding & Bros., Stevens-Duryea; Lower Row, Chas. E. Riess & Co., Hupmobile, and B. F. Goodrich Company, Goodrich Tires.



## HOW NEW YORK DEALERS HANDLING VARIOUS TYPES

### **Baker Electric—**

Despite unfavorable financial conditions in Wall Street, we have enjoyed the best fall selling in our history. We believe in conducting business with a view to normal success, rather than employing brass band methods.

A. J. BROWN.

### **Bulck—**

We have made more sales by 118 between Aug. 1 and Dec. 1, than during the same period last year, and business was better last year than ever before. Every Bulck branch in the country paid a profit for the first time. We are finding a decidedly increasing demand for light delivery wagons, here in New York.

A. L. NEWTON.

### **Cadillac—**

We have already delivered 100 per cent. more cars of the 1914 models than was true of the 1913 models last year at this time. We have taken more orders for late winter and early spring delivery, by 100 per cent., than in any other year. Our enclosed car business has been somewhat phenomenal. Despite the generous allotment of such bodies from the factory, we have been obliged to have special bodies made by four other concerns, one of these being a foreign house. We have been in this location five years, and Jan. 1 we will remove to our new building at 62nd street and Broadway.

ERNST H. BRANDT.

### **Cole—**

The market is stronger for this grade of car, than for those above it. We expect good business, and certainly will get our share. I look for a shortage of cars in the spring. We are selling more machines right now than last year at this time.

F. L. WISEBERGER.

### **Ford—**

The demand for Ford cars is greater than ever before. We are selling many to people of wealth and social position. This does not mean that there will not always be a demand for high grade cars, but a great many people have found that it is not necessary to pay so much, and that the Ford car is a good little car for the money.

A. McDONALD.

### **Garford—**

Last week was the biggest week we ever had. We sold 21 trucks. Inquiries from big concerns respecting large installations indicate that next year will be the biggest truck year we have ever seen. We have attempted to do very little pleasure car business, but upon the arrival of the Garford-Knight we expect to begin an energetic campaign in that field.

PAUL LINEBERGER.

### **GMC Trucks—**

We have sold more trucks since July than in any other similar period. Inasmuch as we handle both gasoline and electric vehicles, we have an advantage over some other concerns. We find business houses very much interested in mechanical transports. We are making a number of fleet sales, but the one-car orders net the largest profit. Just as soon as this little financial flurry is over there are a great many concerns in this city who are going to buy, and buy heavy.

C. B. WARREN.

### **G. V. Trucks—**

More people are interested in commercial motor vehicles than ever before. We are looking forward to 1914 with the expectation that business will be even better than in the past.

F. NELSON CARLE.

### **Haynes—**

Our business shows an increase of from 25 to 35 per cent. every month over that of the same month last year. We are not looking forward to any decrease in the near future. We are feeling pretty good over the outlook for the next year.

E. W. HEADINGTON.

### **Hudson—**

I would say that the possibilities for business are wonderful. I mean by this that the conditions with respect to the automobile buying public are so different today from those of any other period in the history of the industry that the dealers are only just beginning to realize the possibilities. We are selling cars to a large number of people who have always hitherto purchased larger and higher priced machines. I believe this is going to be even more largely true in the future.

D. C. WEGMAN.

### **Hupmobile—**

If the garage conditions in New York were as satisfactory as in many other cities, there would be at least one-third more immediate sales. The excessive garage charges and the ready accessibility to the taxicab have deterred many persons from gratifying their desire to own a machine. In spite of these conditions, the solving of which would mean much additional business, it looks as though we were going to be exceptionally busy during the next few months.

CHARLES E. REISS.

### **Jackson—**

Business should be good in the spring. We are behind on deliveries, and the actual deliveries this year have been greater than last. The conditions look just as good as ever. One phase of the business must be corrected. When a man asks for a pound of coffee and is told that the price is 35 cents he does not offer 30. Why should a different rule apply to the purchase of an automobile?

H. S. STRONG.

### **King—**

Conditions look good to us. This is a comparatively new line in this city, but the people are interested and we expect to make a great many sales.

K. G. JOHNSTON.

### **KisselKar—**

We did more business last month and during December, thus far, than a year ago at this time. It is going to be a good year, so far as I am able to foresee. The demand for small trucks, ranging in capacity from 1500 to 3000 pounds, is very marked just at present.

C. H. McCAUSLAND.

### **Losier—**

Conditions point to a good business in New York. We sold 24 cars in November, and 12 thus far in December. In the future there will be less branches, for the reason that the branch manager has only to consider his salary, while the agent must make his living from the business. I think it will be necessary to solicit trade rather than wait for it to come in.

HARRY S. HOUP.

### **Marmon, Oakland—**

There is plenty of business for the man who does business on a business basis. The greatest problem confronting the New York dealers today is that of securing efficient salesmen. It is not a question of how many cars are sold, but how much profit results from each sale.

THEODORE E. SCHULZ.



## OF CARS VIEW THE PROSPECTS FOR BUSINESS IN 1914.

**Maxwell—**

The demand is gradually getting toward cars selling around \$1000, particularly where it is desired to have a family machine that can be used for every day purposes. Prospects for sales in this field never were brighter than right now.

L. W. BITTING.

**Mets—**

We are going to sell all the cars we can get. We have bona fide orders in our territory for 225 machines, but, of course, our territory covers a wide area. The demand is not as great here in the city, but these little cars are big sellers in the suburban towns. Our principal trouble lies in securing deliveries from the factory fast enough to supply the demand.

ADOLPH MORRIS.

**Moline-Knight—**

We are having many inquiries concerning the new Knight engine, and expect much business in consequence. It is my belief that conditions are much more favorable than formerly, for the reason that the buying public is not demanding so much from the dealer. In a measure, the reason dealers have failed to make money in the past has been the fault of the buyer, and now that these people are beginning to consider the sale of cars as a business proposition, I expect much better results. I would say that conditions for business were better than ever before.

H. E. DELAMATER.

**National—**

Every indication points to better business conditions than ever. We find that 80 per cent. of our sales are to new owners, and that 90 per cent. of these are sold because of the advice of old National owners.

W. T. POERTNER.

**Overland—**

Business looks very good for the trade leaders, of which the Overland is one. Our sales are increasing very rapidly.

L. A. HOWELL.

**Packard—**

Our business for 1913 has been better than in 1912, both as to volume of sales and valuation. Our selling season has kept right up, owing to the weather. New York always has been a good automobile market, and I am of the opinion that we have conditions here which make for good business when the reverse may be true elsewhere.

H. W. NUCKOLS.

**Paige—**

We find conditions much more promising than last year at this time.

CHARLES M. KOHN.

**Palmer-Singer—**

I shall be very much surprised if our sales do not show a 50 per cent. increase next year.

HENRY DROUET.

**Peerless—**

I am a new man in this territory, having only recently been transferred to this branch from Newark. I believe conditions are much better than most men realize, but business principles must be adopted in doing business with the class of men who can afford to buy a high grade, high priced car. The salesman must be able to meet his customer more nearly on an equal basis than has been true in the past. Just at present there is a decided demand for motor trucks and this is a field which offers splendid opportunities for salesmen of the necessary ability.

GEORGE H. SMITH.

**Pierce-Arrow—**

We have always believed that we occupied a position as leader in the sale of high grade cars in New York City. I see no reason to change this opinion at present. Our sales continue to be decidedly gratifying in this respect. In the motor truck field we have been equally successful, having placed 99 machines in two years. The market for trucks is exceptionally good.

ROBERT D. GARDEN.

**Rauch & Lang Electric—**

Business in the electric field, here in New York, is going to be better than ever. I'll do business if conditions are good, and I'll do business if they are bad. I have been spending my time educating the people as to the economy of the electric, and that is why I am confident of success.

C. Y. KENWORTHY.

**Reo—**

The outlook is very good. This is unquestionably a year for high grade cars of medium weight selling at a moderate price. We are interesting many men who intended to purchase higher priced machines. We look for good business.

R. E. INGERSOLL.

**Simplex—**

Our car must be placed in the high grade class. It sells at the highest price. If our business is any indication of the tendency of the public there has been no falling off in the demand for high grade, high priced cars. Our sales have increased each month over any preceding month.

F. H. BOWEN.

**Speedwell, Velle—**

We expect from 50 to 100 per cent. more business next year than this. We have made several holiday sales—quite as many as in other years. By holiday sales, I mean those in which the car is purchased for a Christmas present. The truck business is growing very rapidly.

G. W. GARLAND.

**Stevens-Duryea—**

There always will be men who can afford and will buy nothing but the best. The prospects are better for us the coming year, because some concerns which have been making high priced cars have withdrawn from this field, thereby limiting the output in this class. In this great, big country, there will be sufficient demand to take all the cars our factory can produce.

FRANK EVELAND.

**Studebaker—**

The outlook is good. Ninety per cent. of our prospects walk into the store. So long as people continue to shop up and down the street in search of the car that meets their needs, business must be good.

G. H. PHELPS.

**Stuts—**

Business has been decidedly better since Sept. 1 than during the summer months. We fully expect to do good business during and right after the show.

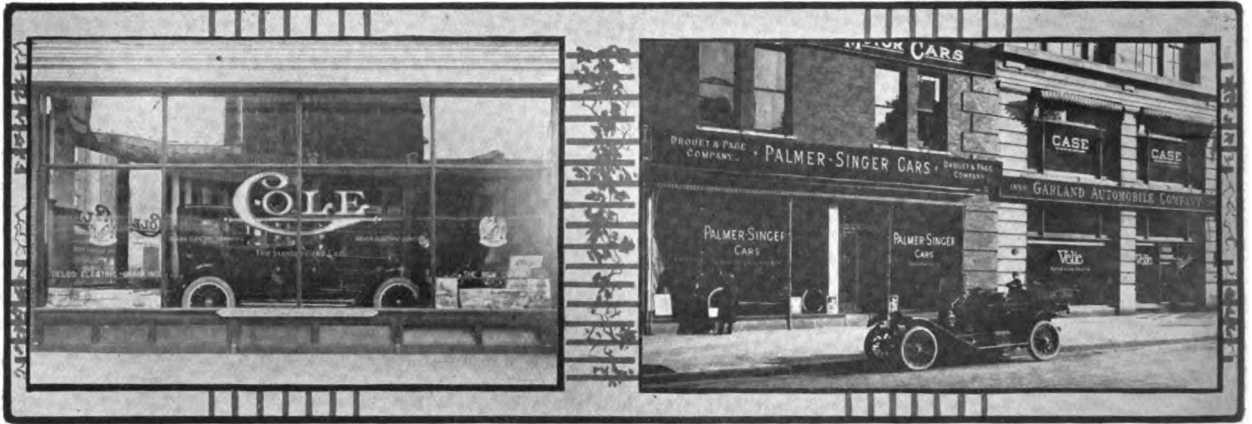
J. H. AMORY.

**White—**

This has been the biggest year of our history, and we look forward to 1914 with a good deal of confidence. Records show that business is becoming concentrated. Our company is getting its share and a large proportion of the commercial vehicle business in New York City.

R. H. JOHNSTON.





At Left, Colt-Stratton Company, Cole; at Right, Drouet & Page Company, Palmer-Singer, and Garland Automobile Company, Speedwell and Velle.

York without making a profit on each transaction.

#### Transients and Shoppers.

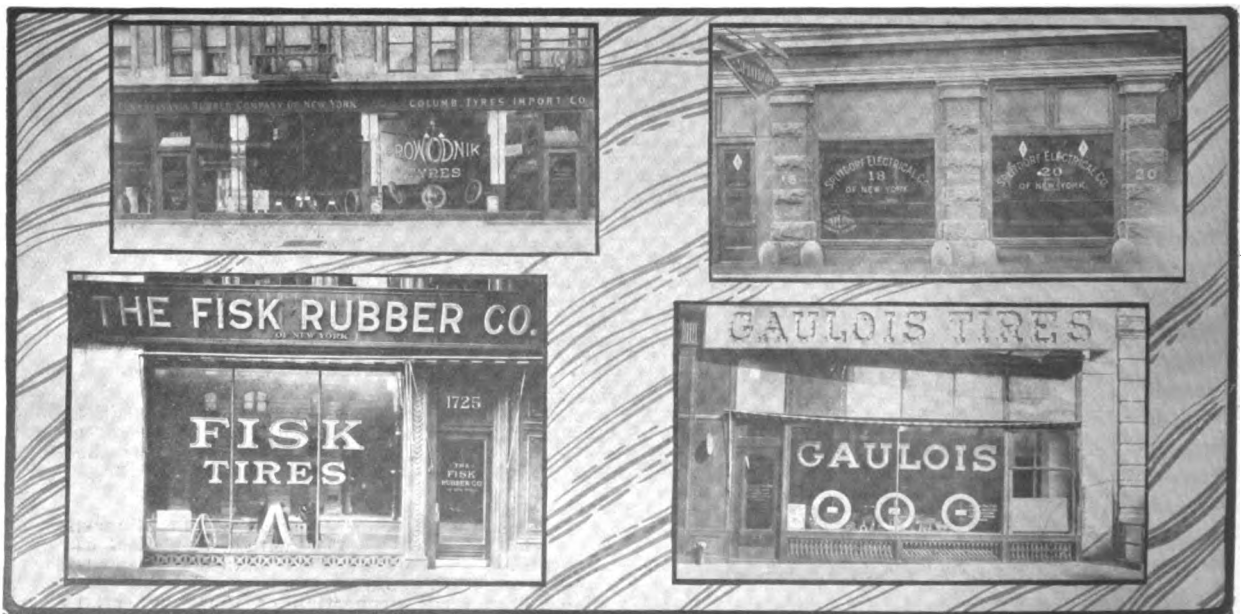
A distinctive feature of the situation in the Metropolis is found in the large transient population of the city. This probably applies more largely to New York than any other centre in the country. There is, of course, the possibility of interesting residents of the city proper and its suburbs, and, in addition, the large number of people who visit New York from a distance are possible purchasers.

Because of this condition there undoubtedly is more shopping for automobiles in that city than elsewhere. People are continually walking

up and down Broadway, from 46th to 63rd streets, the present limits of Automobile Row, searching for the type of car which meets their desires. This does not apply solely to out-of-town prospects by any means. A general estimate, by the dealers themselves, indicates that 75 to 80 per cent. of the prospects are secured in this manner.

#### Rent and Overhead.

Columbus Circle, at Broadway and 59th street, is one of the busiest corners in the city, and locations in that vicinity are held to be most desirable. The United States Rubber building at Broadway and 58th street, might almost be considered the heart of the industry in New York.



Upper Row, Pennsylvania Rubber Company of New York, Pennsylvania Tires; Columb Tyres Import Company, Prowodnik Tires, and Spiltdorf Electrical Company, Spiltdorf Ignition; Lower Row, Fisk Rubber Company, Fisk Tires, and Gaulois Tire Corporation, Gaulois Tires.



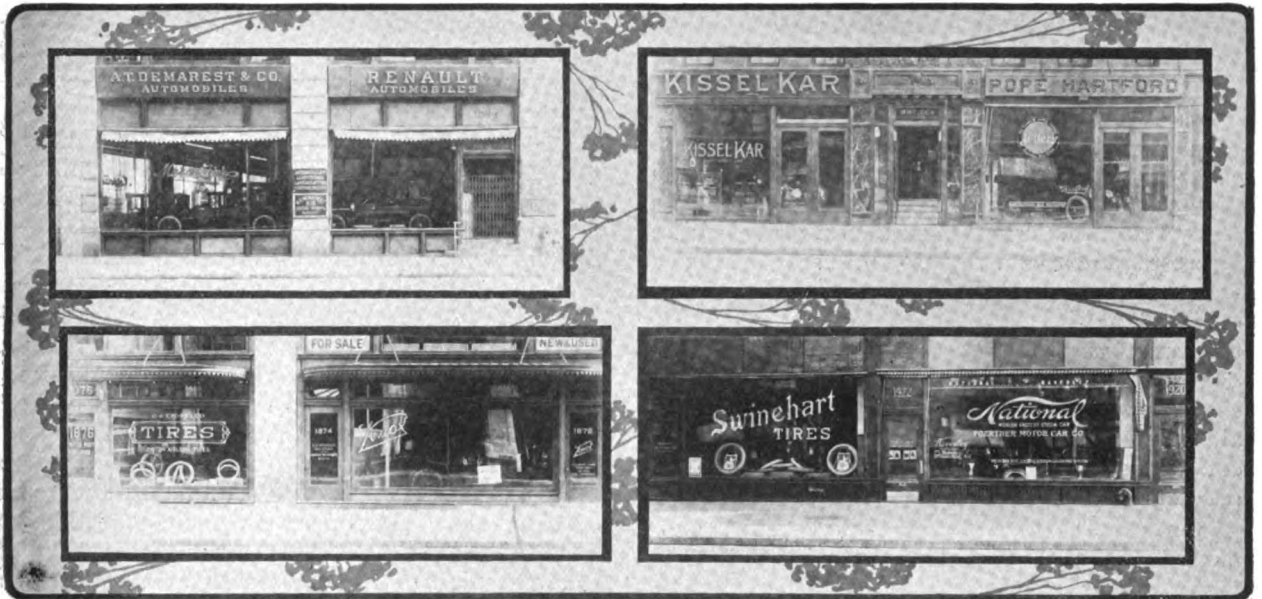
The offices in this structure are occupied by more sales companies and concerns of like character connected with the industry than any one other building in the city.

However, the question of rent has had and is having a decided effect upon the dealers under the reorganization. Palatial establishments—Tiffany fronts as they are sometimes termed by New York dealers—are rapidly becoming a thing of the past. All these items must be considered in the overhead expense, and those who represent the industry in the Metropolis are strongly of the opinion that men with whom they must expect to do business are thoroughly conversant with overhead expenses and the fact that these

ber of cutting remarks which they can bring to bear upon the unfortunate owner who feels he must work upon his own machine have a decidedly depressing effect upon his enthusiasm, to say the least.

#### Solving the Garage Problem.

Several dealers recognize this evil, and at present there is a well developed movement under way looking toward the establishment of a co-operative garage which shall be exclusive in character, to the extent that none but owners who drive and work upon their own machines shall be permitted to secure space therein. The plan is to sell stock to dealers only, the management to rest in a board representing them. At



Upper Row, A. T. Demarest & Co., Renault, Mercedes, Etc.; Kissel Motor Car Company, KisselKar, and Stratton Motor Car Company, Pope-Hartford and Jeffery; Lower Row, C. J. Cross & Co., Dayton Airlens Tires; Knox Automobile Company, Knox; Swinehart Tire & Rubber Company of New York, Swinehart Tires, and Poertner Motor Car Company, National and Waverley Electric.

must be included in the price at which the car must be sold.

#### The Garage Situation.

One other condition enters very largely into the situation—the absence of satisfactory garage accommodations. With this might be linked the ready accessibility of the taxicab. The garage proposition is somewhat distinctive. There are plenty of good garages, but it is said to be almost impossible for an owner to care for his own machine in them. Many garage proprietors forbid such work entirely, and wherever the owner is permitted such liberty, other conditions exist which make for unpleasantness. Most New York owners employ a chauffeur. These men frequent the garages, and the variety and num-

ber of cutting remarks which they can bring to bear upon the unfortunate owner who feels he must work upon his own machine have a decidedly depressing effect upon his enthusiasm, to say the least.

first it is proposed to employ perhaps one or two men for day duty and a like number for nights, these to be in charge of the stores and supplies and to assist the owners as requested by them. Each owner would have his separate stall and a key thereto, with permission to use any necessary machinery or equipment.

The effort is to provide every facility of the private garage, and more, under such conditions as would make the owner feel perfectly at home. It is believed that this would have a decidedly important effect upon the sale of machines and fill a long felt want in the city. The only question as to the success of the plan, from the viewpoint of the dealers, is that of securing a site sufficiently central at a price which will permit



rental charges which will not prove prohibitive.

There will be little disposition to question the statement that these conditions make for stability and permanence. The New York dealers believe they will have the co-operation of the buying public in carrying out these plans, and that business men will be able to appreciate the influence of strictly business principles as applied to the marketing of a product which has come to be recognized as an economic necessity.

#### **Present Market Conditions.**

While, as a whole, the influence of Wall street upon the sale of automobiles is no greater in New York than elsewhere, it is true that some dealers in that city come directly in touch with men who are embraced within the term Wall street, and these may be assumed to be in a position to give valuable information as to the effect of the present market conditions on the automobile industry. Such dealers maintain that the effects of the tariff had been more or less discounted before the passage of the Underwood bill; that any money stringency as the result of pending currency reform is largely manufactured by banking interests, and that the possibilities of a Mexican war are too remote to be considered at all seriously. They are quite as optimistic concerning the immediate future as those who have had less opportunity to study the situation in detail. In short, there is a decided tendency on the part of all New York automobile dealers to feel that conditions already are much better than was true previous to Dec. 1.

On other pages are presented short statements from several dealers representing the different grades of cars, setting forth their opinions with respect to the prospects for business. Not one man was found along Automobile Row in New York who did not feel entirely optimistic as to the immediate future. This feeling is due in part to the reorganized condition of individual concerns, as set forth above, and in part it is based upon the opportunities which have presented themselves during the past month especially. In this latter connection it must be remembered that New York dealers estimate that between 75 and 80 per cent. of their new prospects are recruited from the list of people who go up and down Broadway on a shopping tour.

#### **Electric Pleasure Cars.**

The same conditions apply with respect to the sale of electric pleasure vehicles. The dealers in these machines have been carrying on an energetic campaign of education during the past two years, and for this reason the market is giving much greater promise than ever before. Traffic

conditions in certain sections of Manhattan are such as to discourage driving by women, but the electric has done much to overcome timidity in this respect. The garage situation, mentioned above, has led some men to decide upon the electric, and the method of enforcing traffic regulations has had its effect upon the use of such machines by those who frequent the shopping district and the theatres. There seems good reason for believing that the sale of electrics will increase very materially during 1914.

#### **Commercial Vehicle Business.**

The commercial vehicle situation is affected most largely by financial conditions. New York has proven a good market for both gasoline and electric business wagons, and the results which have been obtained with such machines have created an increased demand. The sales have held up well right through the fall, and the outlook for future business is decidedly promising.

The selling of motor trucks is readily divided into two classifications, one of which embraces the order for a single machine and the other what is termed fleet business. The first involves conditions which permit of the usual character of salesmanship, with the addition of a thorough knowledge of the truck and the character of the service in which it is to be used. The second however, presents a somewhat complicated problem in New York City, from the fact that it often becomes necessary to sell the purchasing agent, engineer, superintendent of the delivery system, president and other officials, and finally the board of directors. To cope with such conditions it usually is advisable to adopt team work, in which different men of the sales staff are working on several members of the combination at the same time.

#### **The Accessory Situation.**

Accessory men in New York, both those engaged in the retail end of the business and those who act as jobbers or wholesalers, are content to accept the opinion of the automobile dealers with respect to future conditions. If there is every indication that new cars are to be sold in increasing quantities, those who provide the supplies and fittings feel that they have no reason for expecting any other result.

#### **Mr. Miles' Views.**

Opportunity was had to secure the views of Samuel A. Miles, general manager of the Automobile Chamber of Commerce and manager of the forthcoming New York and Chicago shows, upon conditions affecting the industry generally. He shares the same optimistic views and in his discussion of the situation, said:



Have you stopped to think just how wonderful has been the growth of this industry of ours? In 1903, less than 10,000 cars were produced. In the year which ended July 1, 1913, more than 400,000 were manufactured in this country. Each year the production has exceeded that of the previous year, and, in addition, if we go back five years each time, it has exceeded that of the entire previous period. See if you get what I mean. We have produced 400,000 cars for 1913, and if we go back to 1908, that is more cars than had been manufactured by the industry previous to and including that year. The same thing ap-

plies for any year and any period of five years previous thereto, as 1910 and the period including 1905, for example.

It is not surprising that the industry should stop to consider this wonderful increase and its bearing upon the automobile market. I feel that the so-called panic of 1907 was the best thing that ever happened to the industry, for it is practically certain that otherwise there would have been an over production in 1908, which would have been serious in its effect. I do not believe that anything of this nature could happen at this time.

## SUCCESSFUL TOLEDO AUTOMOBILE SHOW.

**A**UTOMOBILE dealers in Toledo, O., adopted a very satisfactory innovation in connection with the sixth annual show of the association in the new Automobile Factories building, on East Woodruff avenue, between 12th and 13th streets, Dec. 6-13. Besides the formal exercises the opening evening, when Mayor Brand Whitlock turned the switch which flooded the elaborately decorated halls with light, there was, throughout the week, a special programme of addresses on technical and general motor car subjects by speakers of authority. The object was to supply the prospective owner with information of decided value, and the plan met with a hearty response on the part of the buying public.

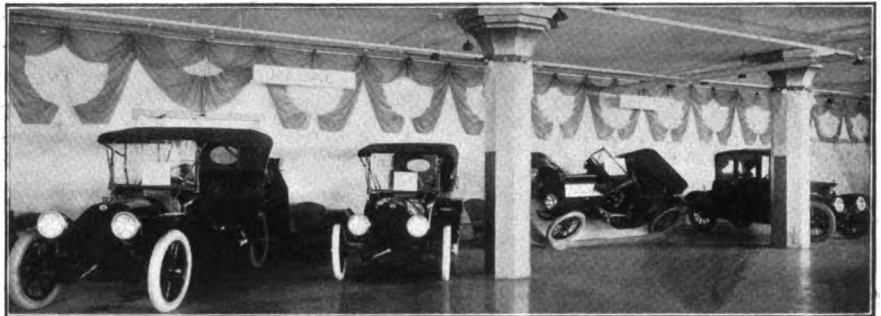
The Automobile Factories building is an entirely new structure and proved eminently satisfactory for this purpose. Previous displays have been held in the Terminal Auditorium, but the new building not only possessed the added advantage of enlarged floor space, but its central location was appreciated by both out-of-town and resident visitors at the show.

Pleasure cars were exhibited on the first floor, and the display of motor trucks, motorcycles and accessories was on the third. Cyclecars were included among the pleasure vehicle displays. The attendance was in every respect gratifying and the amount of business transacted or in prospect wholly in keeping with the magnitude of the undertaking. It is stated that the value of the cars on display was estimated at practically \$1,000,000.

The committee in charge of the event was composed of the following officers and members of the association: President J. G. Swindeman, Vice President Guy R. Ford, Secretary H. W. Blevins, Treasurer J. W. Banting, T. H. Dear-dorf, A. A. Atwood and Frank L. Mulholland. The following were the exhibitors:

**Pleasure Cars**—Abbott Motor Sales Company, Abbott-Detroit; H. J. Adams, Reo; Atwood Automobile Company, Overland, Marmon, Standard electric; Auto Distributing Company, Regal; Banting Machine Company, Paterson; Baumgardner & Kibby, Oakland; Blevins Auto Sales Company, Studebaker; Bunnell Auto Sales Company, Cole, Chevrolet, Detroit electric; Cornelius-Hohly Auto Company, K-R-I-T; Gamble Motor Company, Peerless, Hudson, Garford, Ohio electric, Baker electric; Gauntlett Auto Sales Company, Buick; Roberts-Toledo Auto Company, Ford; E. W. K'Burg, Stearns-Knight; Landman-Griffith Company, Maxwell, Lozier; Lichte Automobile Company, Cadillac; Maumee Motor Company, Empire, King; Standard Auto Company, Packard, Rauch & Lang electric; H. E. Throne, Mitchell, Paige; Union Supply Company, Chalmers, Pierce-Arrow; C. J. Clapp, Winton; White Motor Car Company, White; W. H. McIntyre Company, Detroitter, Jeffery, Lyons-Knight; Grasser Motor Company, Hupmobile; Allen Motor Company, Allen; First Garage & Motor Company, Partin-Palmer.

**Commercial Vehicles**—H. J. Adams, Reo; Atwood Automobile Company, Willys Utility; Blevins Auto Sales Company, White; Bunnell Auto Sales Company, Federal, Detroit electric; Gamble Motor Car Company, Garford, Peerless, Baker electric; Gauntlett Auto Sales Company,



A Corner of the Recent Automobile Show—Regal Cars in the Foreground.

Buick; Standard Auto Company, Packard; Union Supply Company, Pierce-Arrow; Grasser Motor Company, B. A. Gramm's.

**Cyclecars**—Greyhound Cyclecar Company, Greyhound; Lima Cycle Car Company, —.

**Motorcycles**—Oberwegner Motor Company, Excelsior, Henderson; Consolidated Manufacturing Company, Yale.

**Accessories**—Union Supply Company, Toledo Rubber Company, National Cement & Rubber Company, Ray-Kuhn Company, Bock Bearing Company, Toledo Tire & Supply Company, Erie Supply Company, Lewis Foundry Company.

The Moon Motor Car Company, St. Louis, Mo., has shipped one of its new Moon models, with six-passenger streamline body, to Auckland, New Zealand. Vice President Stewart McDonald believes this will prove the initial order in a very satisfactory business with the people of New Zealand.



## GROWTH OF THE AUTOMOBILE INDUSTRY.

**I**N AN authorized statement by Horace A. Bonnell, speaking for the Automobile Chamber of Commerce, attention is not only called to the origin and objects of this body, but to the splendid growth of the automobile industry during the past 14 years. The prediction is made therein that during 1914 the total output in American cars will represent a valuation of something like \$500,000,000, and in accessories, close to \$95,000,000. The number of cars produced for the 1913 season is placed at 400,000.

Fourteen years ago only a few hundred machines were manufactured. In 1903 the industry began to assume increased proportions and 10,000 cars were produced; in 1904, 18,000; in 1905, 24,000. By 1908 the number had jumped to 56,000, and the following year this was more than doubled, the number being 120,000. There was a substantial increase each year, and in 1912, the annual output had reached 200,000.

The Automobile Chamber of Commerce is composed of a large number of automobile manufacturers, and is the outgrowth of an amalgamation of the National Association of Automobile Manufacturers and Automobile Board of Trade, the latter being the name of the organization which succeeded the old Association of Licensed Automobile Manufacturers.

The objects of the organization are: To foster the interests of those engaged in the trade or business of manufacturing automobiles and all other self-propelled vehicles; to reform abuses relative thereto; to secure freedom of its members from unjust and unlawful exactions; to diffuse accurate and reliable information as to the standing of merchants and others dealing with members, as to all inventions, patents, processes or devices designed or intended for use in, upon or in connection with such vehicles and the manufacture thereof, as to the state of the art relative thereto, and as to the condition and development of the trades in which the members are engaged, in the United States and foreign countries; to procure uniformity and certainty in the customs and usages of such trade; to promote the construction of better highways; to advocate the enactment of just and equitable laws affecting members; to settle differences between members, and to promote a more enlarged and friendly intercourse among business men engaged in such trade or dealing with persons engaged therein.

The membership consists of two classes, manufacturing and representative. The former is the

manufacturing concern or corporation and the latter the person designated by the manufacturer to represent it. The directors are: Charles Clifton, Charles C. Hanch, Hugh Chalmers, Alvan Macauley, Samuel T. Davis, Jr., Wilfred C. Leland, Windsor T. White, William E. Metzger, H. O. Smith, Albert L. Pope, J. H. Kittredge, R. D. Chapin, H. H. Rice and J. N. Willys.

The results which have been achieved by this organization, and those which preceded it and of which it is a continuation, are further indicated by the fact that originally most ideas in automobile construction came from abroad, whereas within a few years after the industry gained a foothold in this country, American makers were ceasing to borrow ideas and began inventing and perfecting devices on a large scale. Although American motor car manufacturers imported nearly everything at first, they now export automobile goods valued at more than \$30,000,000 annually, and import less than \$2,000,000 worth.

### TO TALK ON ENGINEERING.

#### Need of Trained Men Spurs Metropolitan Activity in Securing Junior Members.

Automobile engineering as a career will be made the subject of a series of talks before the engineering societies of various colleges according to the plan that has been formulated by the Metropolitan Section, Society of Automobile Engineers, of New York City. The need of trained men is constantly being felt throughout the industry, and it is believed by this body that it properly devolves upon it to assist in attracting the attention of undergraduates to this field.

Incidentally, the advantages of junior membership in the society will be advocated as a means of getting into touch with current practise before engaging in practical work. The plan will be under the direction of the membership committee, which is composed of the following: Morris R. Machol, Hydraulic Truck Sales Company; Roger B. Whitman, Stromberg Motor Devices Company; C. W. Fletcher, Walter Motor Truck Company; E. R. Waterman, Hartford Suspension Company; H. V. R. Scheel, Brighton Mills; Harold W. Slauson; W. J. Somers, New York Telephone Company; Lloyd G. Busby, Electric Launch Company; Austin M. Wolf, Twombly Motors Company; F. C. Wulf, Gray & Davis, and H. G. McComb, General Vehicle Company.







# SPECIFICATIONS OF NEW SIX-CYLINDER MODELS.

Accompanying Table Gives Detailed Information of Chassis Construction for Only Those Models Which Are Entirely New.

| Name and Model       | Cylinders How Cast | Bore and Stroke, Inches | S. A. E. H. P. | Carburetor | Fuel Feed | Ignition  | Cooling | Clutch | Gearset    | Forward Speeds | Tires  | Driving Side | Lighting | Starting | Wheel-base |
|----------------------|--------------------|-------------------------|----------------|------------|-----------|-----------|---------|--------|------------|----------------|--------|--------------|----------|----------|------------|
| Abbott-Detroit B. I. | Triplets           | 3.75x5.25               | 33.75          | Zenith     | Pressure  | Bosch     | Pump    | Disc   | Selective  | 4              | 36x4.5 | Left         | Electric | Electric | 130        |
| American 642, 644    | En Bloc            | 4.00x6.00               | 38.40          | Rayfield   | Pressure  | Eisemann  | Pump    | Cone   | Selective  | 4              | 38x4.5 | Left         | Electric | Electric | 132        |
| American 646         | En Bloc            | 4.25x5.50               | 43.80          | Rayfield   | Pressure  | Eisemann  | Pump    | Cone   | Selective  | 4              | 38x4.5 | Left         | Electric | Electric | 140        |
| American 666         | En Bloc            | 4.30x6.00               | 48.60          | Rayfield   | Pressure  | Eisemann  | Pump    | Cone   | Selective  | 4              | 38x4.5 | Left         | Electric | Electric | 140        |
| Apperson 6-45        | En Bloc            | 3.75x5.50               | 33.75          | Rayfield   | .....     | Mea       | .....   | Band   | Selective  | .....          | 36x4.0 | Left         | Electric | Electric | 128        |
| Apperson 6-55        | En Bloc            | 4.25x5.00               | 43.80          | Rayfield   | .....     | Mea       | .....   | Band   | Selective  | .....          | 37x4.5 | Left         | Electric | Electric | 128        |
| Buick B 55           | Pairs              | 3.75x5.00               | 33.75          | .....      | Pressure  | Delco     | Pump    | Cone   | Selective  | 3              | 36x4.5 | Left         | Electric | Electric | 130        |
| Chandler             | Triplets           | 3.37x5.00               | 27.40          | Stromberg  | Pressure  | Splitdorf | Pump    | Disc   | Selective  | 3              | 34x4.0 | Left         | Electric | Electric | 120        |
| Crescent             | En Bloc            | 4.00x6.00               | 38.40          | Schebler   | Pressure  | Briggs    | Pump    | Disc   | Selective  | .....          | 35x4.5 | Left         | Electric | Electric | 132        |
| Davis 6-50           | Triplets           | 3.75x5.25               | 33.75          | Stromberg  | Gravity   | Mea       | Pump    | Disc   | Selective  | 4              | 37x4.5 | Left         | Electric | Electric | 128        |
| De Soto              | Pairs              | 4.00x5.00               | 38.40          | Schebler   | Pressure  | Remy      | Pump    | Disc   | Selective  | 4              | 36x4.0 | Right        | Electric | Air      | 132        |
| Haynes 26            | Pairs              | 4.25x5.50               | 43.80          | Stromberg  | Pressure  | Simms     | Pump    | Band   | *Selective | 3              | 36x4.5 | Left         | Electric | Electric | 130        |
| Haynes 27            | Pairs              | 4.25x5.50               | 43.80          | Stromberg  | Pressure  | Simms     | Pump    | Band   | *Selective | 3              | 36x4.5 | Left         | Electric | Electric | 136        |
| Henderson            | En Bloc            | 3.75x5.50               | 33.75          | Rayfield   | Gravity   | Eisemann  | Thermo  | Cone   | Selective  | 3              | 35x3.5 | Left         | Electric | Electric | 126        |
| Howard               | Triplets           | 4.12x5.25               | 40.90          | Stromberg  | .....     | Bosch     | Pump    | Cone   | Selective  | .....          | 36x4.5 | Left         | Electric | Electric | 132        |
| Hudson 6-40          | Triplets           | 3.50x5.00               | 29.40          | Zenith     | Pressure  | Delco     | Pump    | Disc   | Selective  | 3              | 34x4.0 | Left         | Electric | Electric | 123        |
| Imperial 44          | Triplets           | 3.75x5.25               | 33.75          | Stromberg  | Pressure  | Simms     | Pump    | Disc   | Selective  | 3              | 36x4.5 | Left         | Electric | Electric | 126        |
| Jeffery              | Pairs              | 3.75x5.25               | 33.75          | Rayfield   | Pressure  | Bosch     | Pump    | Cone   | Selective  | 4              | 36x4.5 | Left         | Electric | Electric | 128        |
| L. P. C. Lewis Six   | En Bloc            | 3.50x6.00               | 29.40          | Rayfield   | Pressure  | Bosch     | Pump    | Disc   | Selective  | .....          | 36x4.0 | Left         | Electric | Electric | 135        |
| Maxwell 50-6         | En Bloc            | 4.12x4.75               | 40.90          | .....      | Pressure  | Splitdorf | Pump    | Cone   | Selective  | 3              | 36x4.5 | Option       | Electric | Electric | 130        |
| Marion G.            | Triplets           | 3.75x4.50               | 33.75          | Rayfield   | Pressure  | Splitdorf | Pump    | Disc   | Selective  | 3              | 35x4.5 | Left         | Electric | Electric | 124        |
| Moon                 | Triplets           | 3.75x5.25               | 33.75          | Rayfield   | Gravity   | Delco     | Pump    | Disc   | Selective  | 4              | 35x4.5 | Left         | Electric | Electric | 129        |
| National             | En Bloc            | 3.75x5.50               | 33.75          | Rayfield   | Pressure  | .....     | Pump    | Cone   | Selective  | 3              | 36x4.5 | Left         | Electric | Electric | 132        |
| Oakland 48           | En Bloc            | 3.50x5.00               | 29.40          | Stromberg  | Pressure  | Delco     | Pump    | Cone   | Selective  | 3              | 35x4.5 | Left         | Electric | Electric | 123        |
| Palmer-Singer K.     | Triplets           | 4.00x5.00               | 38.40          | C. R. C.   | .....     | Mea       | Pump    | Disc   | Selective  | .....          | 36x4.5 | Right        | Electric | Electric | 128        |
| Pathfinder           | Pairs              | 4.12x5.25               | 40.90          | .....      | Gravity   | .....     | Pump    | Disc   | Selective  | 4              | 35x5.0 | Left         | Electric | Electric | 135        |
| Premier Weideley     | En Bloc            | 3.62x5.50               | 31.60          | Carter     | Pressure  | Eisemann  | Pump    | Disc   | Selective  | 3              | 36x4.5 | Left         | Electric | Electric | 132        |
| Pullman 6-48         | Triplets           | 3.75x5.25               | 33.75          | Stromberg  | Gravity   | Bosch     | Pump    | Disc   | *Selective | 4              | 36x4.0 | Left         | Electric | Electric | 130        |
| S. & M. 6-48         | Triplets           | 3.75x5.25               | 33.75          | .....      | Pressure  | Bosch     | .....   | Disc   | Selective  | 4              | 34x4.5 | Left         | Electric | Electric | 130        |
| Vaughan              | En Bloc            | 3.75x5.50               | 33.75          | Rayfield   | Pressure  | Mea       | Pump    | Disc   | Selective  | 4              | 35x4.0 | Left         | Electric | Electric | 138        |
| Velle 6-50           | Triplets           | 3.75x5.75               | 33.75          | Stromberg  | Pressure  | Bosch     | Pump    | Disc   | Selective  | 4              | .....  | Left         | Electric | Electric | 126        |

\*Electric gearshift.

## NEW SIX-CYLINDER CARS CLASSIFIED BY MAKE.

| Name and Model       | Body      | S.A.E. Wheel-<br>Seats H.P. base | Price  | Name and Model     | Body        | S.A.E. Wheel-<br>Seats H.P. base | Price  |
|----------------------|-----------|----------------------------------|--------|--------------------|-------------|----------------------------------|--------|
| Abbott-Detroit B. I. | Touring   | 7 33.75 130                      | \$2290 | Jeffery            | Sedan       | 5 33.75 128                      | \$3250 |
| American 642         | Roadster  | 2 38.40 132                      | 2750   | Jeffery            | Limousine   | .. 33.75 128                     | 3700   |
| American 644         | Touring   | 4 38.40 132                      | 2750   | L. P. C. Lewis Six | Touring     | 6 29.40 135                      | 1600   |
| American 646         | Touring   | 6 43.80 140                      | 2950   | Maxwell 50-6       | Touring     | 5 40.90 130                      | 1975   |
| American 666         | Touring   | 6 43.80 140                      | 4500   | Maxwell 50-6       | Touring     | 7 40.90 130                      | 1975   |
| Apperson 6-45        | Touring   | 5 33.75 128                      | 2200   | Marion G.          | Roadster    | 2 33.75 124                      | 2150   |
| Apperson 6-45        | Roadster  | 2 33.75 128                      | 2200   | Marion G.          | Touring     | 5 33.75 124                      | 2150   |
| Apperson 6-55        | Touring   | 5 43.80 128                      | 2350   | Marion G.          | Speedster   | 3 33.75 124                      | 2150   |
| Apperson 6-55        | Roadster  | 2 43.80 128                      | 2350   | Marion G.          | Coupe       | 4 33.75 124                      | 2650   |
| Buick B-55           | Touring   | 5 33.75 130                      | 1985   | Marion G.          | Sedan       | 5 33.75 124                      | 2950   |
| Chandler             | Touring   | 5 27.40 120                      | 1785   | Moon               | Roadster    | 2 33.75 129                      | 2150   |
| Crescent             | Touring   | 5 38.40 132                      | 1985   | Moon               | Touring     | 4 33.75 129                      | 2150   |
| Davis 6-50           | Touring   | 6 33.75 128                      | 2185   | Moon               | Touring     | 5 33.75 129                      | 2150   |
| Davis 6-50           | Touring   | 5 33.75 128                      | 2150   | Moon               | Touring     | 6 33.75 129                      | 2225   |
| De Soto              | Roadster  | 2 38.40 132                      | 2185   | Moon               | Touring     | 7 33.75 129                      | 2225   |
| De Soto              | Touring   | 4 38.40 132                      | 2185   | Moon               | Coupe       | .. 33.75 129                     | 2750   |
| De Soto              | Touring   | 5 38.40 132                      | 2185   | National           | Touring     | 4 33.75 132                      | 2375   |
| De Soto              | Touring   | 7 38.40 132                      | 2185   | National           | Touring     | 5 33.75 132                      | 2375   |
| Haynes 26            | Roadster  | 2 43.80 130                      | 2700   | National           | Coupe       | 3 33.75 132                      | 2850   |
| Haynes 26            | Touring   | 4 43.80 130                      | 2700   | Oakland            | Touring     | 5 29.40 123                      | 1785   |
| Haynes 26            | Touring   | 5 43.80 130                      | 2700   | Pathfinder         | Touring     | 6 38.40 135                      | 2750   |
| Haynes 26            | Coupe     | .. 43.80 130                     | 3200   | Palmer-Singer K.   | Roadster    | 2 38.40 128                      | 2295   |
| Haynes 27            | Touring   | 6 43.80 136                      | 2785   | Palmer-Singer K.   | Touring     | 5 38.40 128                      | 2295   |
| Haynes 27            | Touring   | 7 43.80 136                      | 2785   | Premier Weideley   | Touring     | 7 31.60 132                      | 2785   |
| Haynes 27            | Limousine | 7 43.80 136                      | 3850   | Pullman            | Touring     | 5 33.75 130                      | 2400   |
| Henderson            | Roadster  | 2 29.40 126                      | 2285   | S. & M. 6-48       | Roadster    | 3 33.75 130                      | 2500   |
| Henderson            | Touring   | 5 29.40 126                      | 2285   | S. & M. 6-48       | Touring     | 5 33.75 130                      | 2500   |
| Henderson            | Sedan     | .. 29.40 126                     | ....   | S. & M. 6-48       | Touring     | 7 33.75 130                      | 2600   |
| Henderson            | Coupe     | .. 29.40 126                     | ....   | S. & M. 6-48       | Limousine   | 7 33.75 130                      | 3500   |
| Howard               | Touring   | 5 40.90 132                      | 2375   | Vaughan            | Touring     | 4 33.75 138                      | 2750   |
| Hudson 6-40          | Roadster  | 2 29.40 123                      | 1750   | Vaughan            | Roadster    | .. 33.75 138                     | ....   |
| Hudson 6-40          | Phaeton   | 7 29.40 123                      | 1750   | Vaughan            | Limousine   | .. 33.75 138                     | ....   |
| Hudson 6-40          | Cabriolet | 2 29.40 123                      | 1950   | Vaughan            | Touring     | .. 33.75 138                     | ....   |
| Imperial 6-44        | Touring   | 5 33.75 126                      | 2000   | Vaughan            | Convertible | .. 33.75 138                     | ....   |
| Imperial 6-54        | Touring   | 7 40.90 137                      | 2500   | Velle              | Touring     | 5 33.75 126                      | 2350   |
| Jeffery              | Touring   | 5 33.75 128                      | 2250   | Velle              | Touring     | 4 33.75 126                      | 2350   |
| Jeffery              | Touring   | 6 33.75 128                      | 2300   | Velle              | Roadster    | 2 33.75 126                      | 2350   |

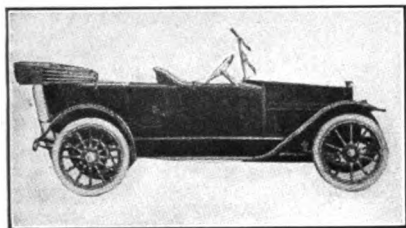


# FEATURES OF NEW FOUR-CYLINDER CARS.

## CRESCENT OHIO.

### Five-Passenger Car Fully Equipped, Including Electric Lighting.

The Crescent Motor Company, Carthage, O., is featuring a large, roomy five-passenger touring car,



termed the Ohio, which is held to have sufficient reserve power to meet varying requirements of service. The chassis details follow conventional practise. The four-cylinder motor is cast in pairs, with bore and stroke of 4.25 by 4.75 inches respectively.

Light weight, combined with a careful selection of material and skillful workmanship are qualities emphasized in the chassis. The driver is placed at the right. The wheelbase is 116 inches.

## CAMERON MODEL 30.

### Four-Speed Direct Drive and Completely Equipped.

The Cameron Manufacturing Company, New Haven, Conn., is offering an entirely new model, in which are incorporated all of those refinements making for comfort and convenience, as well as a low cost of maintenance. The cylinders are cast en bloc and have the valves in the centre of the combustion chamber. The S. A. E. horsepower rating of 21 is very conservative.

The Cameron patented four speeds forward and one reverse gearset, with direct drive on all four, which has proven its efficiency in severe service, is again featured. This, with a flexible, long stroke motor, makes for economy in fuel. The clutch is an inverted cone, self-adjusting, and the rear axle is a Cameron, of the full floating type.

The radiator is of the pointed type, cooling by thermo-syphon, and the large capacity fuel tank is mounted in the cowl dash. The driver is placed at the left with centre control. The upholstery is deep and luxurious and the appointments throughout are in keeping with the high grade of material and workmanship. Electric

lighting and motor starting are standard equipment.

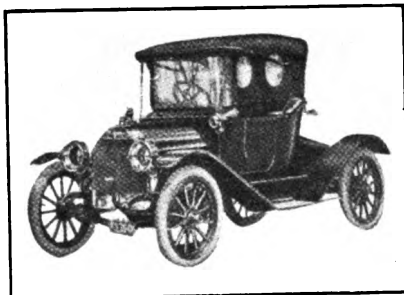
The wheelbase is 115 inches. Full elliptic springs are used at the rear and semi-elliptic at front. The brake drums are extra large, providing an ample margin of safety. The weight of the car, equipped, is 1975 pounds, which places it in the light class.

## WAHL ROADSTER.

### Follows Conventional Practise Except Radiator, Which Is V Shaped.

A V shaped radiator, all metal trimmings nickel plated, and a long stroke motor are features emphasized in the Wahl two-passenger roadster, manufactured by the Wahl Motor Company, Detroit. The power plant follows the very general practise of placing the motor, clutch and transmission in a unit. Although rated at 16.90 horsepower by the S. A. E. formula, the maker claims 24 at 1400 revolutions a minute.

Ample leg room, full size doors and a low centre of gravity are among the features of the model. Ignition is by a true high-tension, fixed spark mag-



neto. Cooling is by thermo-syphon. The clutch is a disc and a selective gearset provides the usual three forward speeds and a reverse. The equipment is very complete.

## MOTORS CAST EN BLOC.

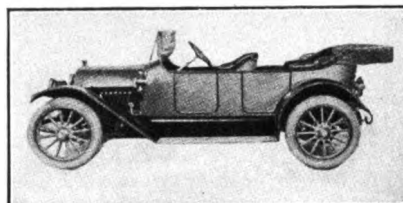
In the new four-cylinder models the use of motors cast en bloc is very noticeable, 15 makers favoring this construction as against eight utilizing the cylinders cast in pairs. This is noted in the lower priced machines, although the en bloc casting is favored by makers of cars listing much higher. With the exception of several well known makes the S. A. E. horsepower rating is below 30, and eight models are equipped with motors rated at less than 20 by the formula. As is to be expected, individual cylinders have entirely disappeared.

With three exceptions, these being strictly high priced machines, the fuel feed is by gravity. In the matter of cooling, the advocates of the thermo-syphon principle and the pump appear to be evenly divided, although with the popular priced cars the first named is generally employed.

## CHEVROLET BABY GRAND.

### Four-Passenger Light Touring Car with Low Centre of Gravity.

The Chevrolet Motor Company, Flint, Mich., is manufacturing two popular priced models, a four-pas-



senger touring car and a two-passenger roadster. The chassis is identical, the cylinders being cast en bloc and having a bore of 3.69 inches and stroke of four. The horsepower rating is 22.

Cooling is by thermo-syphon principle, the clutch of the disc type and the gearset is selective. Ignition is by a Simms magneto and carburetion by a Zenith. The driver is placed at the left. Thirty-two by 3.5-inch shoes are fitted to each wheel. The wheelbase of both models is 104 inches.

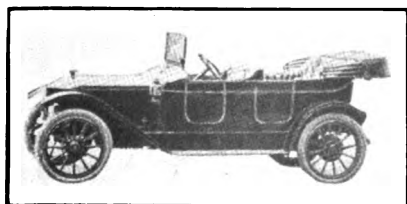
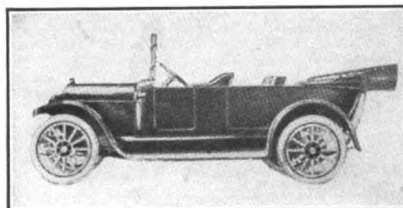
## PARTIN-PALMER.

### Popular Priced Six-Passenger Car Designed for Family Service.

Although the bore and stroke of the Partin-Palmer "38", a popular priced six-passenger touring car, are not given by the maker, the Partin Manufacturing Company, Chicago, it is stated that the rating of 38 is very conservative. The motor is well designed, and presents novel features, including overhead and enclosed valves and a removable cylinder head.

The cylinders are cast en bloc, integral with the upper half of the crankcase to secure rigidity. The cylinder head is secured to the main casting by bolts, the joint being made with copper asbestos rings, insuring tightness. Cooling is by thermo-syphon and the lubricant is circulated by a gear driven pump, it being stated that it will circulate 1.5 gallons a minute at normal speed.

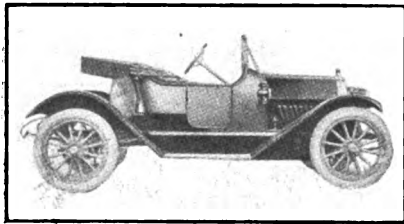
The material and workmanship throughout are strictly high grade and attention has been paid to those details making for comfort and convenience. Although gas and oil lighting are standard equipment, electric lighting and motor starting are supplied at a very low cost.





**CHEVROLET ROYAL MAIL.****Two-Passenger Roadster with Attractive Lines.**

The Chevrolet Royal, a two-passenger roadster, manufactured by the Chevrolet Motor Company, Flint,



Mich., was designed for those desiring a light, ample powered runabout. The chassis details are identical with those of the touring model. The body design is attractive by reason of its straight lines.

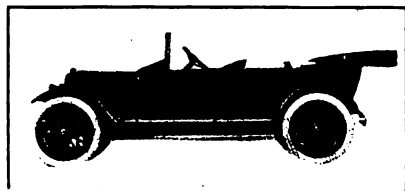
The fuel tank is mounted at the rear of the seats and there is ample room to carry a trunk or spare tires if desired. The equipment includes a top, windshield, etc. Lighting is by oil and acetylene lamps. The tire size is 32 by 3.5 inches all around. A low centre of gravity, ample wheelbase and comfortable upholstery are qualities emphasized in the model.

**LYONS-KNIGHT K.****Silent Knight Motor and Worm Driven Rear Axle Among Features.**

The Lyons-Atlas Company, Indianapolis, Ind., is offering for the season of 1914 the combination of a silent Knight motor and a worm drive rear axle, and it is stated that the model K, as the new car is to be known, is the only one in America having these features. The new vehicle is a strictly high grade car in every particular and embodies the latest and most desirable features that have been perfected and adopted by foreign car builders.

The aim of the manufacturer has been to provide an abundance of room, so as to give the maximum amount of comfort to even the largest people. The sides of the car, including the top of the doors, are high. The Knight motor utilized embodies many improvements over the conventional designs and its output is rated at 55 horsepower at 1200 revolutions. One of its features is an improved oiling system, which feeds lubricant in proportion to the motor speed.

The chassis and wheelbase of the model K cars are similar, except the rear springs, which are heavier on the six and seven-passenger cars. The five and seven-passenger bodies are standard, but the four and six-

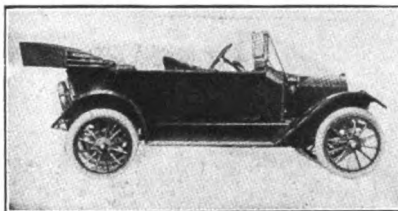


passenger types are built to order. Additional body types are offered in a sedan, five-passenger, and a berline, seven-passenger. The equipment of the Lyons-Knight cars is noticeable for its completeness.

**MAXWELL 25-4.****A Popular Priced Four-Passenger Ample Powered Touring Car.**

By manufacturing in large quantities the Maxwell Motor Company, Inc., Detroit, is able to offer a popular priced machine embodying high grade material and workmanship. The Maxwell "25" was designed to meet the needs and the preference of that class of buyers who consider first cost and that of maintenance. The engineers of the company are well known to the industry and have incorporated in the new design mechanical principles indorsed by sound engineering practise.

The output of the motor is sufficient to meet all requirements of service, and it is a unit with the cone clutch and three-speed selective gearset. The power plant is very compact and a detachable cylinder head makes for accessibility of the valves, which are fully enclosed. The body is a flush side streamline, and ample leg room is provided, both in the driver's



compartment and tonneau. The upholstery is in keeping with the high grade finish, and the equipment is most complete.

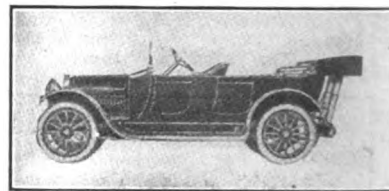
**TIRES AND EQUIPMENT.**

A noticeable feature of the new fours is the use of large tires, and in many instances the car is what may be termed over tired. This applies to the smaller machines as well as the larger and more expensive, and with two exceptions, those of the Mercer and Multiplex, the same size casings are fitted to the rear wheels as to the front. It will be noted in the table of specifications that 32 by 3.5-inch shoes are used on a number of different makes, a size that formerly was considered as odd by the tire manufacturer. Demountable rims are fitted to the more expensive makes, and, generally, quick detachable, to those machines listing under \$1000.

The wheelbases vary considerably, but this is to be expected where a large number of cars of differing price are listed. The maker of the popular priced vehicle has considered the purchaser in the matter of equipment and with rare exceptions the machine is ready for the road with no other expense than that for gasoline and oil.

**ALLEN 40.****Moderate Priced Car with Two and Five-Passenger Bodies.**

The Allen "40", manufactured by the Allen Motor Company, Fostoria, O., was designed to meet the demand



for a moderately priced car, having those refinements and high grade material characteristic of high priced machines. Two bodies are fitted to the one chassis, a five-passenger touring and a two-passenger roadster. These have attractive lines and are complete in appointments.

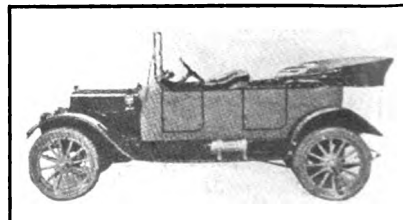
The motor, clutch and gearset are a unit. Attention has been given to the accessibility of components and to the careful selection of material. The equipment is very complete and includes electric lighting and motor starting. The driver is placed at the left. The wheelbase is 118 inches and tires are 34 by four inches.

**READ.****Light, Five-Passenger Touring Car with Wheelbase of 115 Inches.**

The initial product of the Read Motor Car Company, Detroit, is a five-passenger touring car which has a very compact unit power plant, clutch and transmission. The motor is cast en bloc and is rated at 32.6 horsepower. Fixed ignition is favored, a Bosch true high-tension magneto being utilized.

The clutch is a multiple disc and the gearset is of the selective type, providing the conventional three forward speeds and a reverse. Lubrication is a combination force feed and splash, the pump being driven off the camshaft. It is of the adjustable type. The rear axle is of the semi-floating type and full elliptic springs are utilized in the rear, with semi-elliptic at front.

The maker calls special attention to the question of economical fuel consumption, and states that all material employed is high grade, carefully treated and machined. Nothing is left to be desired in the matter of equipment and the rims are demountable. The standard color is gray striped in black, with fenders, hood and running boards in black enamel. Lighting is by gas and oil lamps. The wheelbase is 115 inches.

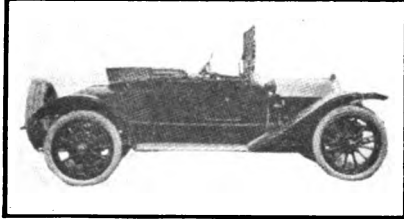




**MERCER MODEL O.**

**Has Easy Riding Qualities, Ample Power and Is Roomy.**

The Mercer type 35, Series O, is a high grade two-passenger car designed to meet the demand for a



large, easy riding runabout. The body lines are very attractive and the upholstery deep and comfortable. The motor is the well known Mercer design and before passing inspection must show a dynamometer pull of 58 horsepower at 1700 revolutions a minute.

Ignition is by a two-spark Bosch magneto, two sets of spark plugs being utilized. The clutch is a multiple disc and the gearset, selective, providing three forward speeds and a reverse. The rear axle is of the full floating type, and throughout the material and workmanship are in keeping with the high grade characteristic of the product of the Mercer Automobile Company of Trenton, N. J. The tires are 34 by four inches.

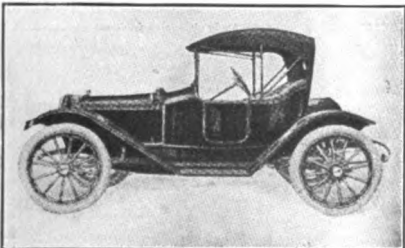
**VULCAN SPEEDSTER.**

**Big Mileage from Fuel and Minimum Cost of Upkeep Are Emphasized.**

Among the qualities emphasized in the Vulcan speedster, made by the Vulcan Manufacturing Company, Painesville, O., is that every part is made in the factories of the company and that each is subjected to rigid inspection before being assembled. The company states that by producing in large quantities and eliminating distributors, etc., it is able to manufacture a strictly high grade machine at a popular price.

The power plant is noticeable for its simplicity and is conservatively rated at 27 horsepower. Flexibility, quietness and economy of fuel are particularly prominent. The cylinders are cast en bloc and the motor, cone clutch and transmission are a unit. The maker calls especial attention to the design of the clutch, stating that the leverage is so proportioned as to make for easy release.

The gearset is of the selective type, providing three forward speeds and



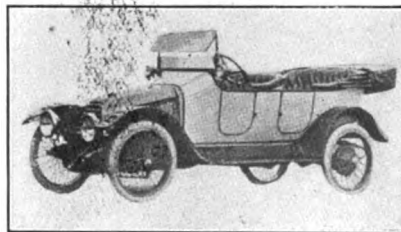
a reverse, and control is by a cane handle lever which is mounted on the transmission housing. The rear construction is sturdy, the differential employing five pinions instead of two and these are of nickel steel, phosphor bronze bushed. The rear axle housing is liberally ribbed and the gears are very accessible for lubrication and inspection. The body is attractive, having full fore doors and the finish is strictly high grade. The Vulcan speedster comes completely equipped.

**MONARCH.**

**Five-Passenger Touring Model, Fully Equipped, Including Wire Wheels.**

Wire wheels, a Renault type radiator and a complete equipment, including electric lighting and motor starting, are among the features of the Monarch car, made by the Monarch Motor Car Company, Detroit. But one body, a five-passenger touring, is fitted. The fuel tank is located in the cowl dash.

Cooling is by thermo-syphon, assisted by a two-bladed fan. The water tank on the top of the radiator is shaped to conform to Renault outline of the hood. Cooling is further assisted by a scoop shaped shield in front of the radiator, which deflects



the air upward so that it will pass through the cooling coils. The unit power plant is suspended on a sub-frame. The rear springs are full elliptic and are mounted in a slightly inclined position on rigid frame brackets.

**LOCATION OF DRIVER.**

The growing tendency to place the driver at the left with centre control is noticeable in the new models. There are exceptions, however, makers of the Monarch and the Metropal locating the driver at the right. The new Mercer models continue the practice of placing the driver at the right.

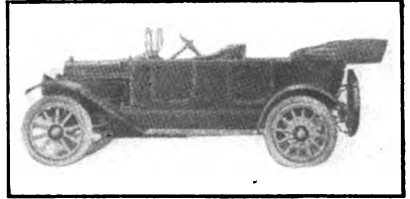
Despite the claims made regarding the advantages of the lighting battery for ignition purposes, the magneto continues to predominate, only one new car utilizing batteries.

Electric lighting and motor starting are standard equipment with the higher priced new four-cylinder cars. Some makers of machines selling for \$1000 underlist the equipment as extra, and the majority provide a Prest-O-Lite gas tank and call attention to the efficiency of the type of headlights fitted. It will be noted that the lighting is not defined with some models.

**MAXWELL 35-4.**

**Designed to Accommodate Five Large Persons and for a Family Car.**

The Maxwell "35", manufactured by the Maxwell Motor Company, Inc., Detroit, was designed to meet the de-



mand for an ample powered car, capable of seating five large persons and to be operated at a minimum cost. It may be termed a family car in that ample room is provided both in the driver's compartment and tonneau, and the upholstery is deep and comfortable. The equipment is complete and includes electric lighting and motor starting. The accessories are strictly high grade. Jiffy curtains are standard equipment.

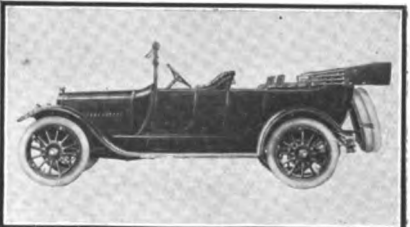
The cylinders of the motor are cast en bloc and the horsepower rating of 35 is said to be conservative. The valves are liberal in diameter, fully enclosed and very quiet in operation. Cooling is by a centrifugal pump with a large tubular radiator. The Splitdorf dual system of ignition is standard equipment.

**LOZIER.**

**Five-Passenger Model with Auxiliary Folding, Disappearing Seats.**

The Lozier Motor Company, Detroit, is offering a new four-cylinder model with the cylinders cast en bloc, and the company states the horsepower production is 56. The four cylinders and upper part of the crankcase are an integral casting and the clutch and transmission are a unit. One of the features of the motor is the elimination of the usual intake manifold, it being cast with the cylinders. The very general use of the silent chain drive is noticeable, it being employed with the electric motor starter and lighting dynamo.

Cooling is by pump and ignition by a Bosch high-tension magneto. The fuel is fed by pressure, the tank being located at the rear of the chassis. The pressure system of lubrication is utilized. By using auxiliary seats, which fold into a recess in the back of the front seat, provision is made for accommodating seven passengers. Besides touring bodies a two-passenger design will be produced. The equipment is very complete.

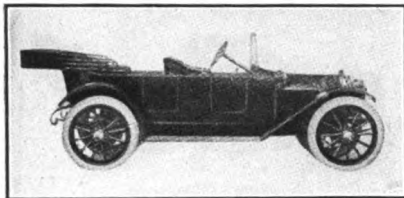




**VULCAN.**

**Designed to Meet the Demand for a High Grade Family Machine.**

The Vulcan five-passenger touring car, made by the Vulcan Manufacturing Company, Painesville, O., lists



complete at \$100 more than the speedster, and with the exception of the rear springs, frame, etc., and those parts necessary to care for the additional weight of three passengers, the mechanical details are similar to those of the smaller machine. The wheelbase is 115 inches.

The machine was designed for a family car and the maker states that from 26 to 39 miles to a gallon of fuel may be obtained in average service. This is held to be due to the efficiency of the motor and the use of over sized ball bearings. One of the qualities claimed for the Vulcan is that it can be turned in a 30-foot radius, due to the unique method of attaching the steering lever to the knuckle.

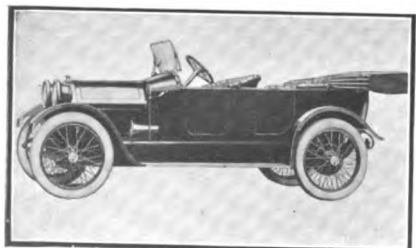
**HENDERSON DE LUXE.**

**Large Tires, Wire Wheels and Bi-Fuel Carburetor Among Features.**

The Henderson Motor Car Company, Indianapolis, Ind., is offering for the season of 1914 a new chassis termed the De Luxe, to which will be fitted five-passenger touring, two-passenger roadster, sedan and coupe bodies. The De Luxe motor has a bore of 4.125 inches and stroke of 5.5, and the company's rating is 46 horsepower. Cooling is by thermo-syphon with large intake and outlet water manifolds which, with a large size honeycomb radiator, assure proper temperatures under the severest service.

A cone clutch is employed, and the gearset located on the rear axle provides the three conventional forward speeds and a reverse. The rear axle is a Stutz. The driver is placed at the left with centre control. One of the features of the equipment is the option of a Rayfield or Harroun bi-fuel carburetor, the latter employing gasoline and kerosene.

The usual emergency brake lever is eliminated, the left pedal actuating the clutch and service brakes while



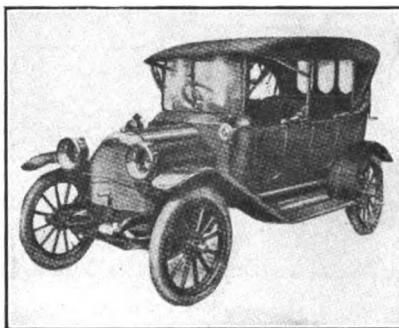
the right serves the emergency brakes. De Luxe is over tired, 35 by five-inch Goodyear tires being utilized. Wire wheels are regular equipment with wood optional. The fuel tank is located in the dash and the upholstery is deep and luxurious. The standard colors are dark olive and gray, at the option of the purchaser. The equipment is complete and includes electric lighting and motor starting.

**WAHL.**

**Four-Passenger Touring Car with Ample Reserve Power.**

The Wahl five-passenger touring car, manufactured by the Wahl Motor Company, Detroit, was designed to meet the growing demand for a light, popular priced family vehicle. The body is roomy and well upholstered and there is plenty of leg room both in the driver's compartment and in the tonneau.

The cylinders of the motor are cast in pairs and their dimensions place them in the long stroke class. Economy of fuel, silence and accessibility are qualities emphasized by the maker. Lubrication is by the constant level splash system, a gear



pump maintaining the proper height of the oil in the crankcase. The frame is provided with a double drop, making for a low centre of gravity, and the front of the frame is inswept, providing a short turning radius for operation in narrow streets. The Wahl comes completely equipped. Lighting is by gas and oil lamps.

**FAVOR DISC CLUTCH.**

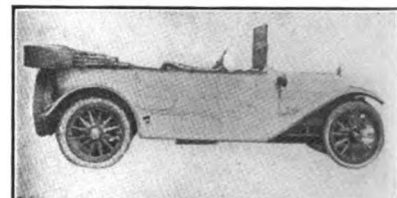
The disc type of clutch is gaining adherents, judging from the use made of both the dry plate and lubricated forms in the new models announced for 1914. Of 21 new designs, 12 favor the disc while nine use the cone. One friction type appears in the Crown.

The use of the selective type of gearset is practically universal with two exceptions, that of the Cameron and Saxon. The former employs its patented Cameron transmission, while the Saxon is to be equipped with a two-speed progressive gearset. The Lozier and Cameron provide four forward speeds, the balance being fitted with the conventional three forward speeds with direct drive on the third.

**MERCER MODEL M.**

**Five-Passenger Car Designed for Maximum Comfort and Speed.**

The Mercer Automobile Company, Trenton, N. J., is offering a roomy, five-passenger touring car known as



type 35, Series M. The new design has a wheelbase of 124 inches and its equipment leaves nothing to be desired, including, as it does, electric lighting and motor starting.

The same mechanical construction which has proven so satisfactory in speed contests and other service, has not been materially changed. No changes have been made in the motor, which is of the T head type, with the cylinders cast in pairs. The bore and stroke are 4.5 by five inches, respectively. The body design is very attractive, being noticeable for straight line effects and deep upholstery. The seats are 22 inches deep from front to rear and the cushions are nine inches thick.

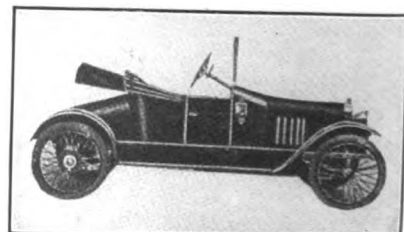
**FLYER.**

**Light Two-Passenger Roadster with Wire Wheels.**

The Flyer, manufactured by the Flyer Motor Car Company, Elizabeth, N. J., is a light, two-passenger roadster having a long stroke motor, rated at 12.10 by the S. A. E. formula, although the maker states it will develop 23. Cooling is by the thermo-syphon principle and the clutch is a disc. The transmission is of the selective type, providing the conventional number of speeds.

The driver is placed at the left and the steering column is set at a comfortable angle, giving the machine a racy appearance. The body design is attractive, a sloping deck extending from the rear of the driver's seat to the rear of the chassis. The wheelbase is 100 inches. Wire wheels are included as standard equipment. The Flyer comes completely equipped and is designed for those desiring a popular priced car capable of meeting the requirements of every day service at a low cost of maintenance.

An electric lighting and motor starting system, a Ward Leonard, is also offered, being listed at \$100 extra.



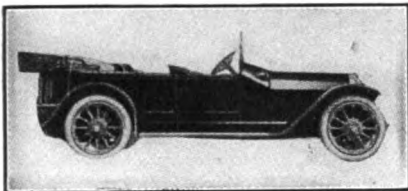


# FEATURES OF NEW SIX-CYLINDER CARS.

## **PATHFINDER.**

### **Leather Stocking Model Has Two Body Styles.**

The Motor Car Manufacturing Company, Indianapolis, Ind., has joined the ranks of makers favoring



the V shaped radiator, the construction being utilized on its new Pathfinder model, termed the Leather Stocking. Two bodies are fitted, a seven-passenger touring and a six-passenger berline. Both are fully equipped.

The cylinders of the motor are cast in triplets and have bore of 4.125 inches and stroke of 5.25. Splash lubrication is utilized, with plunger pump and positive feed to the three main bearings. The fuel feed is by gravity from an 18-gallon tank. The clutch is a dry disc and the gearset provides four forward speeds with direct on the third.

## **CHANDLER.**

### **Light Weight, Big Mileage and Complete Equipment Among Features.**

The Chandler light weight six, made by the Chandler Motor Car Company, Cleveland, O., is stated to weigh less than 3000 pounds when fully equipped, and its designers, who have long been identified with the automobile industry, claim 16 miles to a gallon of fuel and 700 miles to a gallon of lubricant. The motor is constructed in the factory of the company, and is of the L head type with the cylinders cast in triplets. It is in the long stroke class and is held to operate efficiently at three miles an hour on the high speed and to be capable of propelling the car 55 miles an hour. One of the features of the power plant is the use of extensions from the crankcase, which extend to the frame, obtaining weather proof qualities and eliminating the usual undershield.

The oiling system is contained within the motor, a rotary pump located in the engine pan pumping the lubricant to all main bearings and working parts. The individual trough system is utilized. The transmission is a three-speed, selective,

enclosed within the case housing the multiple disc clutch, and all bearings are F. & S. imported annular. The last named are used throughout.

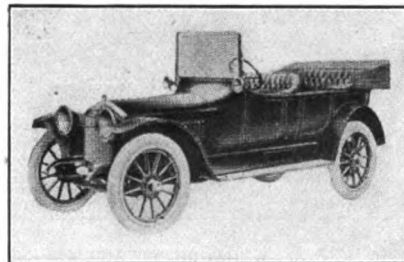
The lighting and motor starting system is a Westinghouse. In addition to a five-passenger car, a two-passenger roadster, five-passenger limousine, five-passenger sedan and three-passenger coupe are marketed. The equipment is in keeping with the high grade material and finish.

## **DAVIS 6-50.**

### **Is Equipped with Five and Six-Passenger Bodies.**

The George W. Davis Motor Car Company, Richmond, Ind., offers the Davis 6-50 with two body styles, five and six-passenger types, and these are noticeable for the streamline effect, large flush doors and high grade finish. The motor is a Continental with enclosed mechanism and three point suspension, which forms, with the clutch and transmission, a unit power plant.

Ignition is by a Mea magneto, carburetion by a Stromberg, and the selective type gearset provides four



forward speeds and the usual one reverse. The electric lighting and starting system is a Gray & Davis, separate units. The full floating rear axle is of liberal proportions and the brakes are ample in size.

The radiator has a rounded front, and the tool box is concealed in a dust shield, which connects the running board with the body. The trimming of the car is nickel and black, and the equipment is high grade, including every convenience.

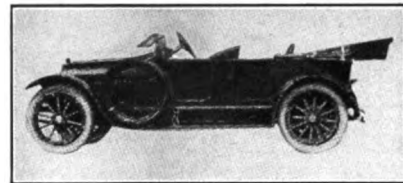
## **MOTOR FEATURES.**

Of the 31 new six-cylinder models tabulated, it will be noted that 14 are of the en bloc type of casting, a decided gain over 1913, when this method of casting was confined largely to four-cylinder cars. That casting the units in pairs is favored by some is evidenced by five makes, these including the Buick, Haynes, Jeffery, Pathfinder and de Soto. Triplet units are seen in the Abbott-Detroit, Chandler, Howard, Hudson, Imperial, Marlon, Moon, Palmer-Singer, Pullman, S. & M. and Velle. The L head type of motor predominates. The Continental motor has been adopted by a number of makers, and the bore of 3.75 inches and stroke of 5.25 is employed in 14 different models.

## **HUDSON 6-40.**

### **Weights Under 3000 Pounds—Has Three Body Styles.**

Fourteen to 17 miles to the gallon is claimed for the Hudson 6-40, made by the Hudson Motor Car Company,



Detroit. It is a light machine, weighing 2940 pounds with the phaeton body. It is seven inches longer than the Hudson 33, which had a wheelbase of 116 inches, and 30 per cent more power is claimed for the motor, which has bore of 3.5 inches and stroke of five.

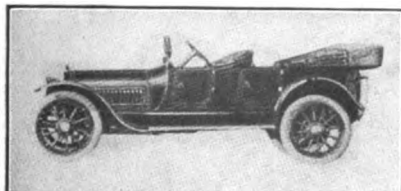
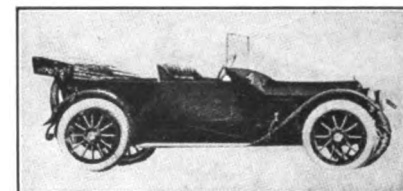
A new radiator has been adopted, its top being rounded, and there is a sharp corner where the vertical sides meet the top section. Another feature is the use of a coping-over edge. In variance with former practise, the flywheel is partially enclosed. The Delco ignition, lighting and starting system is employed. There are three body styles.

## **VELIE 6-50.**

### **Three Body Styles, Including Roadster, for New Chassis.**

The Velle line, manufactured by the Velle Motor Vehicle Company, Moline, Ill., is increased by the addition of a new model known as the 6-50. It is equipped with a Continental motor, which is stated to be the only component not a Velle product. It is of the long stroke type and is rated at 33.75 horsepower by the S. A. E. formula. The wheelbase is 126 inches and the tires are 27 by 4.5 all around. Lighting and starting are by the Gray & Davis system.

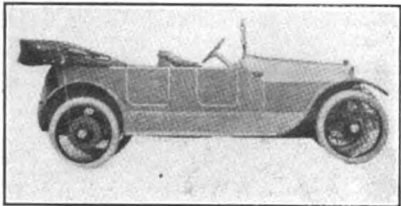
The bodies are of the straight line type with clean running boards. Among the features are the sloping hood with the long undercut cowl and crown fenders with flat strips at the edge. Another is the double overlaid hinge of the bonnet, which makes for strength, it being claimed that the weight of an ordinary man will not deflect it noticeably. The roadster presents novel features, having a sloping deck with doors on either side to accommodate two suit cases. The top equipment has a ratchet holder, making for rigidity on rough roads. Equipment is complete.





**PALMER-SINGER.****Roadster and Touring Models Noticeable for Refinements in Detail.**

The Palmer & Singer Manufacturing Company, Long Island City, N. Y., is offering a new car termed the



model K, which is fitted with three types of bodies, these having two, four and five-passenger capacities. The finish is Brewster green with a light green stripe. Auxiliary seats are obtainable with the four.

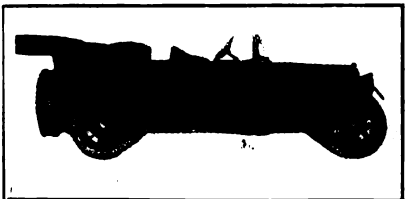
The motor is rated in excess of 45 horsepower and the cylinders are cast in triplets. Two independent ignition systems are provided and carburetion is by a C. R. G. The clutch is a multiple disc, built into the flywheel. The driver is placed at the right with control levers inside of the body. The wheelbase is 128 inches, tires 36 by 4.5 inches, and the equipment includes electric lighting and motor starting. The upholstery is in keeping with the high grade material and workmanship of the design.

**ABBOTT-DETROIT.****Belle Isle Model, a Light Six, with Wire Wheels.**

A six-cylinder model, termed the Belle Isle, has been added to the 1914 line of the Abbott Motor Company, Detroit. The motor is a late type Continental having bore and stroke of 3.75 and 5.25 respectively, and is rated by the maker at 60 horsepower. The reciprocating parts are light, making for smooth operation, and the lightening of the components is said to increase the horsepower by 15 per cent, as compared with a motor having the same dimensions.

It is of the L head type and in connection with the gearbox, provides a unit power plant construction. It is lubricated by the Continental's latest system, which is a circulating splash arrangement with a new type of circulating pump. The clutch is a multiple dry disc, and the diameter of the plates has been increased over that of previous models. The rear axle is full floating, and the gearset provides four forward speeds with direct on the third and with the fourth geared up 25 per cent.

The fuel tank is mounted at the

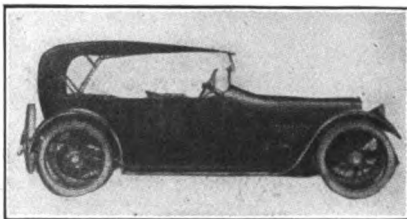


rear, and the wheels are equipped with demountable rims and 36 by 4.5-inch tires. The lighting and starting system is an Auto-Lite. A six-passenger body is fitted to the chassis, also a roadster, which is supplied with wire wheels as standard equipment. The company states that the new model is the best balanced car yet brought out under the Abbott name. The equipment leaves nothing to be desired.

**PULLMAN 6-48.****Features Electric Gearshift and Wire Wheels.**

A Vulcan electric gearshift, wire wheels and a power tire pump driven off the flywheel of the motor, are among the many features of the Pullman 6-48, made by the Pullman Motor Car Company, York, Penn. The motor is of the L head type with the cylinders cast in triplets, and is rated at 38 horsepower at 1500 revolutions a minute. The oiling system is a combination force feed and splash with a constant level. The multiple disc clutch comprises 21 discs covered with Raybestos, and forms a part of the unit power plant.

The electrical equipment comprises four independent systems for ignition, starting, lighting and gear-



shifting. The cranking motor is geared to the flywheel and the teeth on the wheel serve as a driving medium for the tire pump, the driven gear being swung into mesh at the option of the driver.

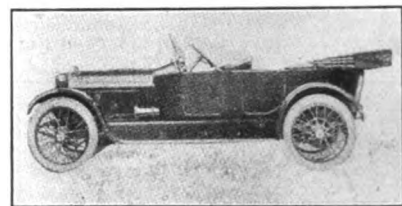
**CARBURETION.**

At the New York shows last year it was noted that several makers had replaced gravity feed by the pressure, a method much in vogue several years ago. It was freely predicted that in 1914 it would become general practice to mount the fuel tank at the rear of the chassis and supply the carburetor by pressure feed. The method has several advantages. It permits locating the carburetor in proximity to the water jackets of the cylinders, the heat of which assists in raising the temperature of the fuel and makes for easier starting on the present grade of fuel, in that opportunity for condensation with a long intake pipe is avoided.

Some makers hot water jacket the intake manifold and the majority also utilize the heat of the exhaust for increasing the temperature of the air supplied to the carburetor. With the fuel tank at the rear it is held that a better balance is obtained. Practically every machine is provided with means for regulating the air.

**HENDERSON.****Four Attractive Body Designs Are Offered with New Model.**

Listing wire wheels as regular equipment, optional with wooden members, the Henderson Motor Car



Company, Indianapolis, Ind., claims to have been the first concern in this country to offer choice to the purchaser. The motor of the new six is noticeable for its compactness and clean lines of exterior. Although rated at 33.75 by the S. A. E. formula, the company states it has developed 54 in block tests.

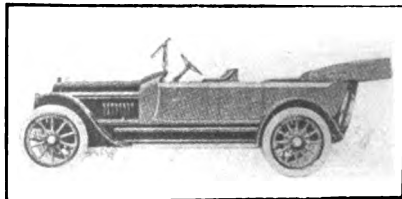
Cooling is by thermo-syphon, fuel feed by gravity and ignition by an Elsemann magneto. The clutch is a highly perfected cone and the gearset provides three forward speeds. The driver is located at the left with centre control, and as with the four-cylinder model, the emergency brake lever is eliminated, the clutch pedal actuating the service brakes.

The upholstery and equipment are fully in keeping with the high grade material and construction.

**JEFFERY.****Adopts En Bloc Motor and Four-Speed Gearset.**

Another entrant to the six-cylinder field is the Thomas B. Jeffery Company, Kenosha, Wis., well known to the industry as the maker of the Rambler cars. This name, however, has been dropped, and the new products of the company will be known as the Jeffery. The cylinders are arranged in pairs and have bore and stroke of 3.75 and 5.25 inches respectively. One of the motor features is the water jacketing of the intake manifold. The undershield is eliminated, being replaced by plates extending from frame to crankcase.

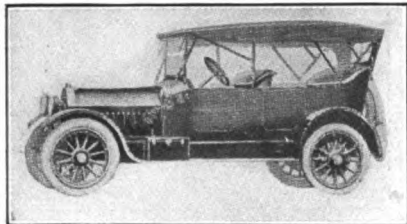
Between the gearset and cone clutch is a leather universal coupling, consisting of six rings about six inches in diameter and .1875 thick. It is employed to care for any misalignment, and it is stated that shocks and stresses are avoided in clutch action. The wheelbase is 128 inches and the tires are 36 by 4.5 inches. Four bodies are fitted, five and six-passenger touring, sedan and limousine. The equipment is complete.





**MARION G.****All Four Body Styles Are Listed at Same Price.**

The Marion Motor Car Company, Indianapolis, Ind., has been added to the list of six-cylinder makers, the



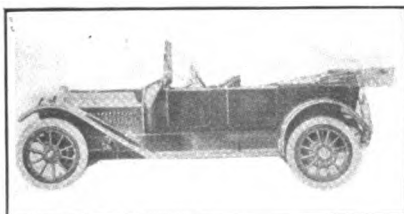
company announcing a chassis to which is fitted four body types, a two-passenger roadster, five-passenger touring, four-passenger coupe and a five-passenger sedan. The cylinders are of the L head type, cast in triplets, and have a bore of 3.75 inches and stroke of 4.5. The maker claims a rating of 50 horsepower.

A feature of the oiling system, which is a combination of pressure feed to the main bearings and automatic level splash, is the elimination of the usual breather pipe. The crankcase compression escapes through openings directly into the valve mechanism pockets, lubricating the mechanism. The company has adopted the left hand drive, and the new model is completely equipped.

**HAYNES MODEL 27.****Features Vulcan Electric Gearshift on All Models.**

The Haynes Automobile Company, Kokomo, Ind., is featuring the Vulcan electric gearshift with its new models, comprising two chassis to which are fitted a number of attractive and high grade bodies. The operation of the electric gearshift is simple. In place of the usual lever, a neat, small dial of push buttons, known as the selector switch, is located in the centre of the steering wheel. There are seven of these buttons and those numbered 1, 2 and 3, control the three forward speeds, while the reverse is marked "R" and neutral "N". The starter and horn are designated by letters "S" and "H".

The selector switch is arranged with a mechanical lock so that only one button can remain in position at a time. These buttons control the operation of a set of electro-magnets, or solenoids, there being one for each speed. The speed is selected by the driver pushing down a button, and, upon depressing the clutch pedal fully, and releasing it, the desired

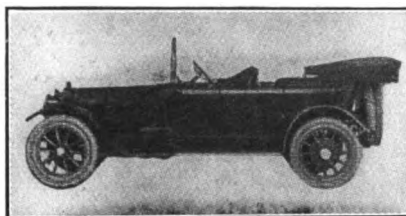


gear is automatically meshed. The clutch is then engaged in the usual manner. Other changes of speeds are made in the same manner and all are accomplished instantly. It is impossible to make any errors as the construction may be termed fool proof. Its advantages in operation, especially in traffic, are obvious.

**HOWARD.****Long Stroke Motor and Wheelbase Are Features.**

The model D Howard is a five-passenger touring car and is manufactured by the Howard Motor Car Company, Connersville, Ind. The cylinders of the motor are cast in triplets and have a bore of 4.125 inches and stroke of 5.25. According to the S. A. E rating the output is 40.90, but the maker states that block tests have shown a considerable increase over this rating.

The carburetor is a late type Stromberg, and ignition is by a Bosch high-tension magneto. Cooling is by pump and the radiator is of ample capacity. Cooling is further assisted by an adjustable fan. An improved type of cone clutch is utilized and easy engaging qualities are emphasized in the construction, which is fully protected from foreign ele-



ments. The gearset is of the selective type.

A feature of the chassis is the use of large tires, 36 by 4.5-inch shoes being used front and rear. The driver is placed at the left, and starting and lighting is by electricity. The wheelbase is 132 inches. The equipment is most complete and the accessories in keeping with the high grade of finish.

**CLUTCHES, GEARSETS.**

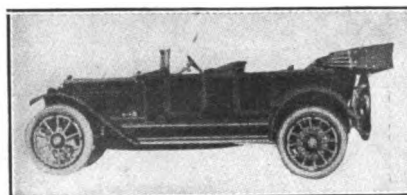
The disc type of clutch does not appear to have lost ground as 17 models are fitted with either dry or lubricated plates. The cone is utilized in 10 models, while two makers favor the band, these being the Haynes and Apperson.

The gearsets are all of the selective type, as was to be expected. It would appear that the advocates of the four-speed gearbox are gaining, as 13 show this form, and in the majority of instances the third speed is the direct drive, with a fairly large step-up on the fourth. Twelve makes retain the three-speed gearbox.

The electric gearshift is standard equipment with two makers, the Haynes Automobile Company and the Pullman Motor Car Company. This applies only to the new sixes and does not take into consideration other models continued from last season.

**MAXWELL 50-6.****High Grade Car with Every Convenience.**

The leader of the Maxwell line, made by the Maxwell Motor Company, Inc., Detroit, is the 50-6, which



is fitted with a touring body for 5-7 passengers, richly upholstered and leaving nothing to be desired in the matter of equipment and accessories making for comfort and convenience. The motor is cast en bloc and the rating claimed by the company is said to be conservative. Flexibility and economy of fuel are among the qualities emphasized in the power plant, which is noticeable for its simplicity and compactness.

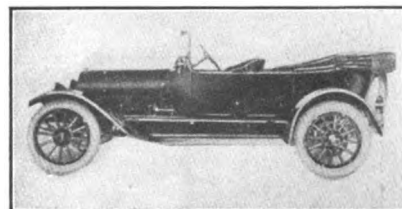
Throughout the best of material and workmanship is incorporated, and all components are ample in size. The wheelbase is 130 inches, tires 36 by 4.5, front and rear, and the electric lighting and motor starting units are separate. The carburetor is a special Maxwell design, and large mileage is held to be obtained.

**BUICK MODEL B 55.****Maker Adopts Delco Lighting and Starting System.**

The Buick B55, made by the Buick Motor Company, Flint, Mich., is a five-passenger touring car with streamline body and having a deep cowl dash. Overhead valves are features of the motor, it being held that the type not only makes for maximum power, but economy of fuel. The bore and stroke of the cylinders, which are cast in pairs, are 3.75 by five inches. The rating according to the S. A. E. formula is 33.75 horsepower, but the company claims considerably in excess of this.

Demountable rims are standard equipment, and the wheelbase is 130 inches. The rear axle is of the full floating type.

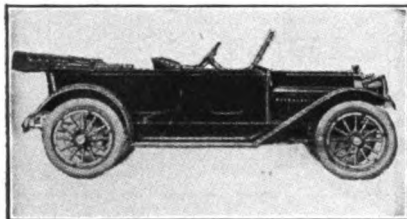
The Buick Motor Company is now equipping its product with the Delco system, which provides ignition, lighting and starting. The clutch is a cone, the gearset selective, providing three forward speeds, and the tires are 36 by 4.5 inches, front and rear. The equipment is most complete, including every convenience.





**IMPERIAL MODEL 44.****Five-Passenger Touring Car Fully Equipped.**

The Imperial Automobile Company, Jackson, Mich., has replaced one of its four-cylinder models with a new



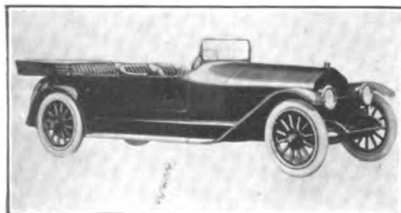
six, which is termed the 6-44. It is fitted with a Continental motor having a bore of 3.75 inches and stroke of 5.25, and the maker rates it at 48 horsepower. The cylinders are cast in triplets, ignition is by a Splitdorf dual system, and a force feed constant level system of lubrication is employed.

The clutch is a disc, 13 plates faced with Raybestos, and the gearset is selective with the usual three forward speeds. The rear axle is a full floating design, the wheelbase is 126 inches and 36 by 4.5-inch tires are fitted both front and rear. The electric light and motor starting system is a North East. The touring body is very attractive in appearance.

**NATIONAL SIX.****Attractive Line of Bodies Feature of New Model.**

The new National six, built by the National Motor Vehicle Company, Indianapolis, Ind., is a car of striking appearance, with its long, low body lines described as a one-piece design. There is a smart slope from the cowl to the radiator cap. From the radiator to the rear of the car is one continuous harmony of converging lines. Throughout the mechanical details are fully in keeping with the high grade characteristic of this concern. The touring car accommodates five passengers; the torpedo toy tonneau, four.

The motor is cast en bloc and the cylinders have a bore of 3.75 inches and stroke of 5.5. Lubrication is by splash with pressure feed to the main bearings and timing gears. The ignition system is dual, magneto and battery. The cooling system has been improved and the radiator is smaller than with previous models, but is fully as efficient. The fuel feed is by pressure, the tank being located at the rear of the chassis. The cone clutch may be removed without dis-

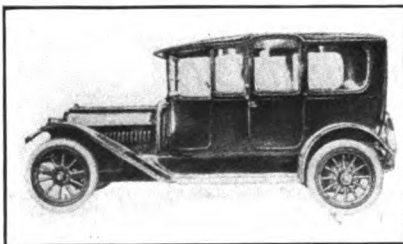


turbing the transmission, this feature being obtained by the use of a double universal in the short shaft between the clutch and the gearset. The equipment is most complete and includes electric lighting and motor starting. The wheelbase is 132 inches and tires are 36 by 4.5, mounted on Firestone demountable rims, with one extra rim.

**HAYNES MODEL 27.****Seven-Passenger Limousine Is Richly Appointed.**

The Haynes sixes, made by the Haynes Automobile Company, Kokomo, Ind., are known as models 26 and 27, and to these chassis are fitted a number of attractive bodies which were designed to provide the utmost comfort. The cowl is made from one sheet of metal and comes down to a graceful curve to meet the hood, and the hinges are concealed. The doors are extra wide and are upholstered in the leather. The standard color is Indiana blue for the body, with black gears and wheels.

The motors of both chassis have a bore of 4.25 inches and stroke of 5.50. Ignition is by a Simms magneto, carburetion by a Stromberg and cooling by pump. The electric gear-



shift provides three forward speeds. The tires are 36 by four inches, and the driver is placed at the left. The equipment includes electric lighting and starting, a power tire pump and many other high grade accessories.

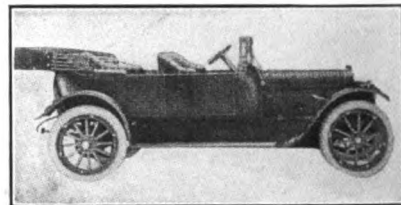
**DRIVER'S LOCATION.**

As was noticeable last season, the practise of placing the driver at the left has gained many adherents, and it may be said to be universal, insofar as the new sixes are concerned. Twenty makes locate the operator at the left with centre control, while two place the driver at the right, the Palmer-Singer and de Soto. The Maxwell Motor Company, Inc. is the only maker who gives option.

It is interesting to note that the practise of using different sized tires has been abandoned and the use of the same sized casings both front and rear has been due to the adoption of the demountable rim. The 36 by 4.5-inch shoe is utilized by 11 makers, while nine cars are equipped with odd sizes; that is, the diameter. The largest diameter casings are noted in the American models, which are 38 inches. When the weight of the chassis, body and equipment are considered it is noticeable that the manufacturer has over tired his product, reducing cost of maintenance.

**APPERSON 6-55.****Chassis Is Fitted with Two Attractive Bodies.**

The Apperson Bros. Automobile Company, Kokomo, Ind., is offering two six-cylinder chassis, termed the



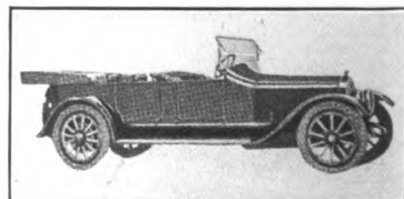
6-45 and 6-55, and, with the exception of wheelbase, motor and tires, they are similar. The 6-45 is equipped with an en bloc motor having a bore of 3.75 inches and stroke of five, while the cylinder dimensions of the 6-55 are 4.25 by five inches. The last named motor is rated at 43.80 horsepower by the S. A. E. formula.

The band type of clutch is continued and a selective form of gearset is utilized. The tire sizes are as follows: Model 6-45, 36 by four; 6-55, 37 by 4.5 inches. The driver is placed at the left and the wheelbase of both chassis is 128 inches. The bodies accommodate two and five passengers. The equipment includes electric lighting and starting and those accessories accompanying a high grade machine.

**MOON.****Six Body Styles, All Electrically Equipped.**

The new six-cylinder car manufactured by the Moon Motor Car Company, St. Louis, Mo., is fitted with six body types, having passenger capacities of two, four, five, six and seven, and wire wheels are supplied at a cost of \$100 extra. The motor is of the L head type and although the bore is but 3.75 inches and stroke 5.25, the maker rates it at 50 at 1300 revolutions a minute.

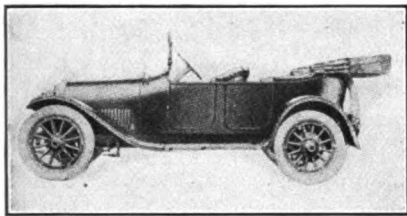
A Delco system provides ignition, starting and lighting. The clutch is a dry disc and the gearbox provides four forward speeds with direct on the third. Fuel feed is by pressure, the wheelbase is 129 inches, and the tires are 35 by 4.5, front and rear. The power tire pump is driven off the flywheel of the motor. An interesting feature of the Moon chassis is a centrifugal oil draining device inside the wheel hub, preventing any lubricant reaching the brakes and impairing their efficiency. Electric lighting and motor starting are included in the equipment, which is leaves nothing to be desired.





**OAKLAND 48.****En Bloc Motor Has Removable Cylinder Head.**

The Oakland model 48, made by the Oakland Motor Car Company, Pontiac, Mich., may be termed a small



six in that its motor has cylinder dimensions of 3.5 by five inches, giving a horsepower rating of 29.4 according to the S. A. E. formula. The wheelbase is 123 inches. The exhaust manifold is of the double-way type, it being claimed that the construction prevents heating and carbonizing of the exhaust valves, as two successive explosions do not pass the same valve opening.

The Oakland features are continued, a cone clutch being used, and the circulation oiling system. Drive to the axles is through an unenclosed shaft, parallel to which is the torque arm, the front end of which is supported by a cushion spring. The fuel is fed by pressure and the tank has a large filler cap and gauge. The tire carriers are of special design and are said to be rattle and chafe proof.

**AMERICAN 666.****Features Underslung Suspension and Roomy Body.**

The American Motors Company, Indianapolis, Ind., is featuring three new six-cylinder models for 1914, having in the past confined its efforts to the production of fours. The new models include the 642, a two-passenger car; 644, a four-passenger body on the same chassis; 646, a six-passenger car, and the 666, a six-passenger car, known as the Big Six.

The bore and stroke of the cylinders of the 666 are 4.5 by six inches respectively, and the S. A. E. horsepower rating is 48.60, which is the largest of the new sixes announced up to the present time. The cylinders are cast en bloc and are of the T head type. Accessibility and compactness are noticeable in the design.

Lubrication is by splash for the cylinders and pressure feed to the main bearings, connecting rods, etc., the splash level being maintained by a gear pump. A feature of the cooling system is that the lower water connection from the cylinders to the pump is cast in the upper part of the crankcase. To provide for unequal

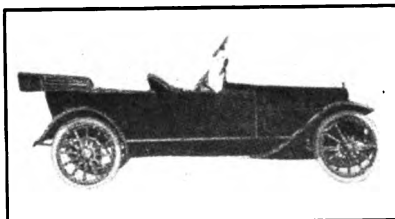
heating there is an expansion coupling between the water jackets and the crankcase.

Another feature is the use of a double water connection from radiator to cylinders, one connection going to each upper corner of the radiator instead of the conventional single connection to the centre. The fan adjustment is novel, a slotted base in the fan pillar providing means for regulating the distance between the pulley centres.

**CRESCENT.****Long Stroke En Bloc Motor and Wheelbase Featured.**

The Crescent model Royal is a five-passenger touring car which is manufactured by the Crescent Motor Car Company, Carthage, O. The motor is rated at 38 horsepower by the S. A. E. formula, the cylinders having a bore of four inches and stroke of six, which places the engine in the long stroke class. The cylinders are cast en bloc, and the power plant is very compact.

Carburetion is by a late model Schebler and the fuel is fed by the pressure system, a large capacity tank being featured. The Briggs system of ignition is standard equipment, it providing dual ignition, a magneto and dry cells. Cooling is by



pump, and the radiator is of such capacity as to insure proper temperatures under all conditions of service.

The clutch is of the disc type and the conventional selective form of gearset is utilized. The car is over tired, 34 by 4.5-inch shoes being fitted to all four wheels. The wheelbase is 132 inches and electric lighting and motor starting are standard equipment.

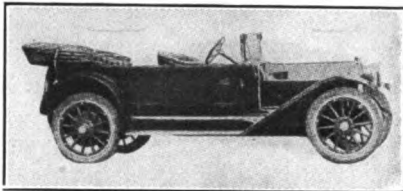
**COMPLETE EQUIPMENT.**

Last season was termed an equipment year and, while it appeared that the manufacturer left nothing to be desired in the way of accessories making for comfort and convenience, the 1914 models reveal several features not noted last year. Electric lighting and motor starting are, of course, standard, but one maker using other than electricity for starting. In the case referred to compressed air is employed.

One of the most practical accessories, and one that is becoming popular with motorists, is the power air pump, and it will be found on a number of new models, as well as those continued from last season with refinements. One-man tops, so called because of their ease of operation, are offered by several makers.

**DE SOTO SIX.****Maker Emphasizes Durability of Components.**

The de Soto Motor Car Company, Auburn, Ind., states that its product is designed to withstand hard service



and that all components of the chassis are built with an ample margin to endure the severest strain. The motor is cast in pairs, and the cylinder dimensions are four by five inches, developing, the maker states, 50 to 55 horsepower.

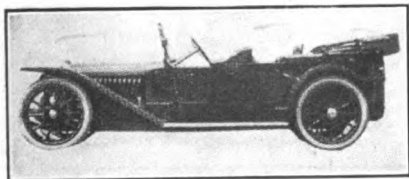
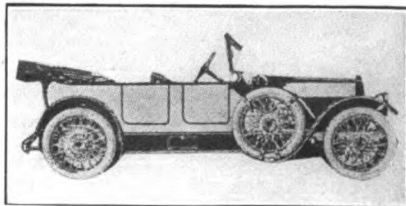
The clutch is a multiple disc, gearset a three-speed selective and the rear axle of the full floating type. Imported Hess Bright bearings are liberally employed. The maker calls special attention to its frame, stating the double construction utilized is not found in any other car. The wheelbase is 130 inches, and the springs are extra long. Thirty-six by four-inch tires are fitted all around. Electric lighting is included in the equipment, but the motor is started by compressed air, a system providing means for inflating the tires as well. Option is given of electric or an exhaust horn.

**S. & M. 6-48.****Bodies Noticeable for Completeness of Equipment.**

The S. & M., made by the S. & M. Company, Detroit, is a newcomer in the automobile industry and the motor used is known as the Continental light six, rated by the maker at 48 horsepower. The cylinders are cast in triplets and the three point method of suspending the power plant is utilized. The carburetor is of the automatic type and is non-adjustable.

The clutch is a multiple disc, the steel disc alternating with those faced with gray asbestos. Large surface area is provided and the adjusting mechanism is very accessible. The gearset affords four forward speeds. The driver is placed at the left with control levers in the centre.

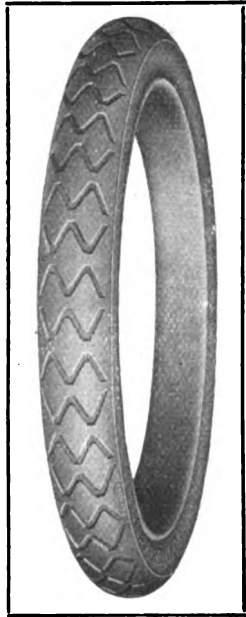
The wheelbase is 130 inches, tire size 34 by 4.5 inches, and three body types are fitted. All are a modified form of streamline design. The cars are completely equipped, included in which is a Golde patent top.





### NEW ANTI-SKID TIRE.

#### Republic Rubber Company Marketing New Type Termed the Republic "W M".



The Republic "W M" Tread Tire.

The Republic Rubber Company, Youngstown, O., maker of Republic tires and tubes, announces a new type of anti-skid tire called the Republic "W M" tread, which is designed especially for light cars and comes in the following sizes: Thirty by three, 30 by 3.5 and 32 by 3.5 inches. As will be noted by the accompanying illustration the anti-skid tread resembles an M or a W, according to the position of the casing. The same high grade materials and workmanship are incorporated in the new shoe as is characteristic of the products of this company which manufactures the Republic staggered non-skid and plain tread casings. The line of inner tubes includes both the gray and black line. The Republic Rubber Company has branches and agencies in the principal cities of the United States, Canada and Mexico.

### DETROIT'S AUTOMOBILE SHOW.

#### Dealers Claim a Larger Display of Cyclecars Than New York or Chicago.

The importance of Detroit as the centre of the automobile industry is expected to have its effect upon the 13th annual motor car show in that city, Jan. 17-24. The list of exhibitors will include 31 lines of pleasure cars, 11 of trucks and more cyclecars than are to be displayed either at New York or Chicago, according to the information supplied by the management. The display will be held in the new Ford building.

### NATIONAL TELESCOPE PUMP.

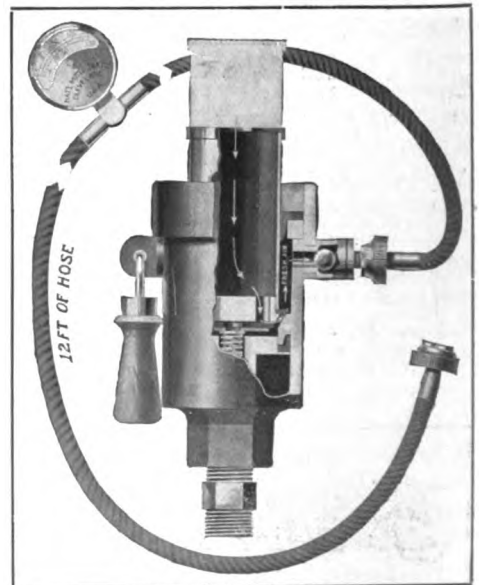
#### National Motor Supply Company Announces New Design of Spark Plug Type.

The National Motor Supply Company of Cleveland, O., has just placed on the market a

new pump of the spark plug style, which is termed the National Telescope pump. It is designed along novel lines and differs from those marketed in a number of particulars, as will be noted by the accompanying illustration. The body is made from close grained cylinder iron and is carefully machined inside. A floating piston, containing a metal piston ring, has a brass tube attached to its upper side. As the piston in the engine cylinder moves up and down the compression and suction move the piston in the pump in a like manner, causing the brass tube or piston stem to slide in and out at the top of the pump.

The compression chamber is between the walls of the brass tube and outside body. As the piston moves downward the fresh air is drawn in through the hole in the top of the pump, passes the valves through the piston and enters the compression chamber to break the vacuum, as shown by the arrows. The National utilizes 100 per cent. of the area inside the pump, and the maker claims that in this way as much air is obtained as with pumps twice its size. The new pump is only five inches high. Its compactness and light weight make for easy storing in the car. Another feature of the pump is that it is quickly fitted.

The two parts of the piston head are machined from a solid steel bar, making for durability. The best of material is employed throughout and all parts are machined to very close limits. A feature of the National is a neat wooden handle for tightening or loosening it in the cylinder. The pump comes equipped with 12 feet of woven cover hose and a dial pressure gauge when ordered. A half and .875 - inch nipple is supplied with each, and metric sizes when desired. The pump is moderately priced.



National Telescope Pump.



## WITH THE CYCLECAR MANUFACTURERS.

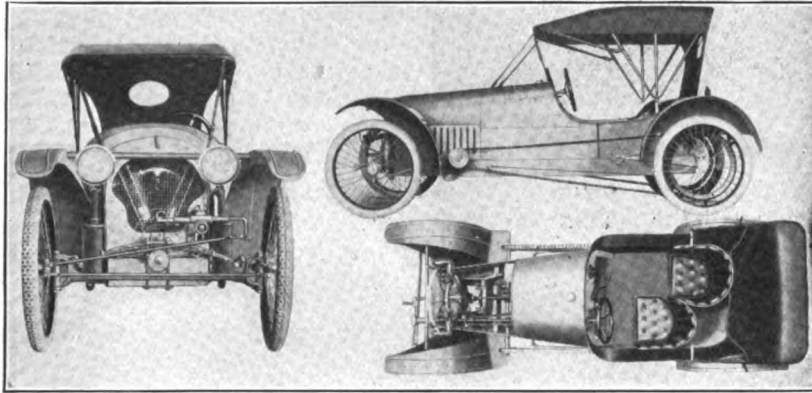
### A Brief Resume of the Principal Characteristics in Design and Construction with the Models Now Offered by Makers of the Latest Type of Machine in America.

**E**ACH year in the history of the automobile industry has witnessed some particular feature in design or construction which has been

that there are at least 30 such concerns in Detroit alone. An accompanying table gives the general specifications for 33 different makes, work upon which has progressed to a point where the designers feel warranted in making these public. Even with many of these the manufacturer reserves the right to make such changes in design or construction as further road work and experimentation shall deem advisable.

#### Seating Arrangement.

The cyclecar is held to have had its origin abroad, the first machine to which this term was applied having been the Bedelia of France. In France and Continental Europe practically all cyclecars are arranged to seat the passengers in tandem, following the example of the Bedelia in this respect. The Ajax, which for some unknown reason has been classified as an American machine, although made by the Briscoe Freres of Paris (perhaps it is because Benjamin and Frank Briscoe are Americans and were so long identified with the American automobile industry), departs from this rule, and arranges

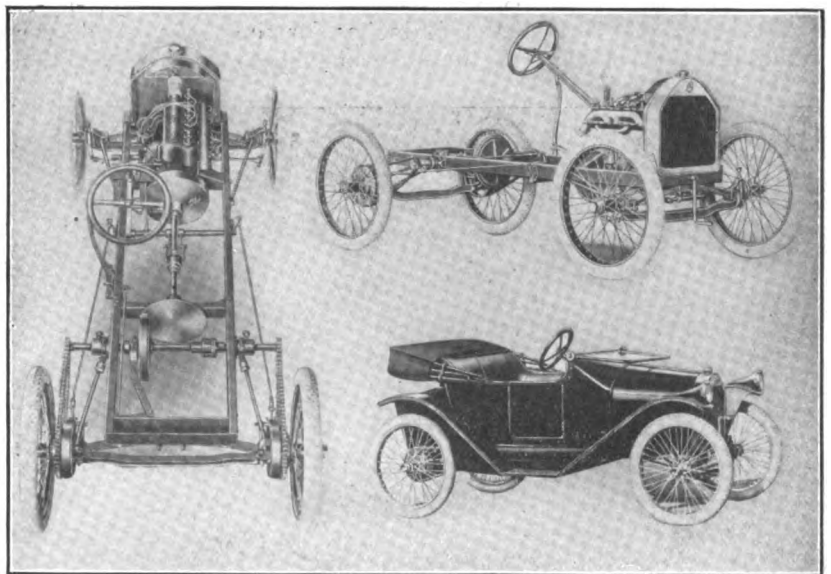


Front, Side and Plan View of Pioneer, with Staggered Seating.

sufficiently prominent to be classed as distinctive in a measure. Present indications would seem to suggest that 1914 is to be a cyclecar year. Insofar as the American industry is concerned, the latter part of 1913 has been a period of preparation, and it is expected that the advent of spring will see a comparatively large number of these little machines ready for the market.

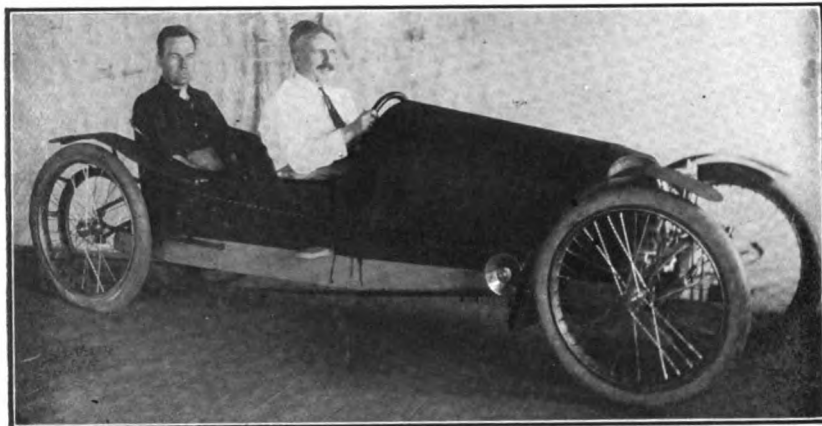
As yet, there is some difficulty in determining the exact point where the line of demarcation must be drawn between the cyclecar and the small car, for with the remarkable interest which has been manifested by the public in machines of these types, several new small four-cylinder cars have made their appearance, as set forth elsewhere in this issue. In a broad sense, however, a cyclecar is taken to mean an automobile constructed on the simplest possible lines.

No less than 47 different manufacturers have made public announcement of their intention to place a cyclecar on the market. This probably falls far short of the total number of experimenters, since it is stated



Plan and Side View of Trumbull Chassis and the Completed Car.





**The Imp Has Tandem Seating with the Driver Located in Front.**

to seat its two passengers side by side.

Of the 33 makes listed, 16 have adopted the side-by-side method, 11 have tandem seating, two give an option in this respect and four employ a staggered arrangement of seats.

It would appear that the designers were about evenly divided upon the question, and there is quite as much diversity of opinion as to the location of the driver. With cyclecars seating the passenger side by side, the driver is located at the left in a majority of instances, but a few place him at the right, while with the tandem machines the driver is in front with all except the Davis, De Cross and Stickney.

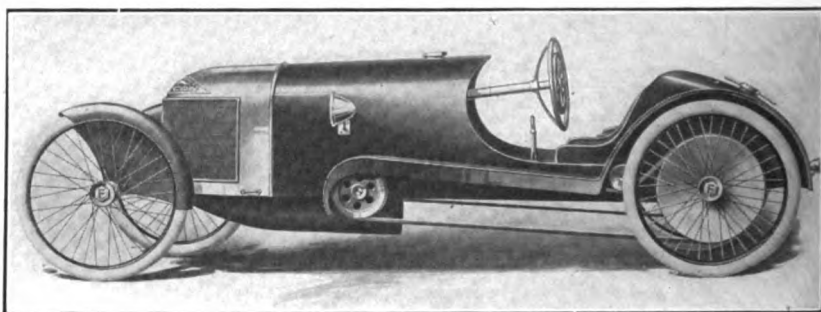
#### **Wheelbase.**

The wheelbase varies from 80 inches for the Trumbull to 108 for the Puritan. A mean average

for the 33 makes is 98 inches, but the De Cross, Victor and Woods are the only ones to adopt this mark, while eight have wheelbase of 96 inches and six of 100. It might be supposed that the tandem cars would have the longer wheelbase, but this does not always hold true. The Puritan, with longest wheelbase of all, seats its passengers side by side, while the shortest tandem machine is the Davis, with 93 inches.

#### **Tread.**

Some attempt has been made to classify cyclecars according to tread. This plan undoubtedly is based on the fact that practically all foreign cyclecars have a tread of less width than standard, this applying in Great



**The Falcon Is an Example of Side-by-Side Seating with Driver at Left.**

Britain, where the majority of these machines have side-by-side seating, as well as in Europe. If this rule were strictly adhered to in this country, it would be necessary to eliminate the Cornelian and Downing, as both have standard tread of 56 inches.

The narrowest tread of all is 30 inches, on the Woods. On the Continent, what might be regarded as the standard cyclecar tread is 36 inches. Twelve American designers have decided upon that figure, while the Twombly comes pretty near it with 38. In Great Britain the average is 42 or 44, and America has one of the former and five of the latter.

#### **Weight.**

A few manufacturers lay great stress upon the weight, while others have not considered this of sufficient importance to make



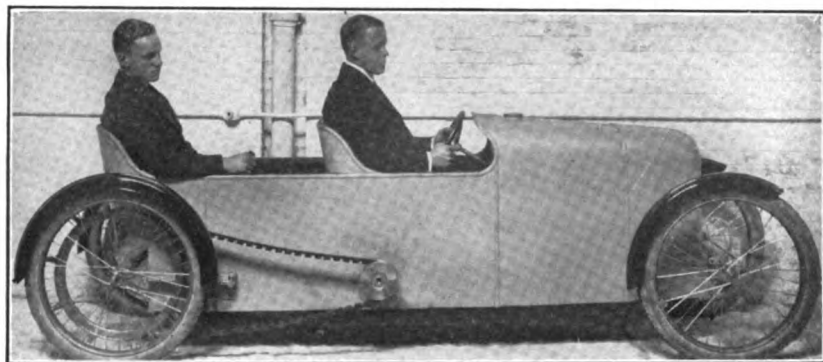
**The Los Angeles Also Seats Side by Side, but with Driver at the Right.**



public. American cyclecars weigh from 325 for the Falcon, to 1150 for the tandem Car-Nation. The mean average for the machines the weight of which is known is about 600 pounds, and the Brown, Imp, LaVigne and Zip tip the scales at exactly that figure.

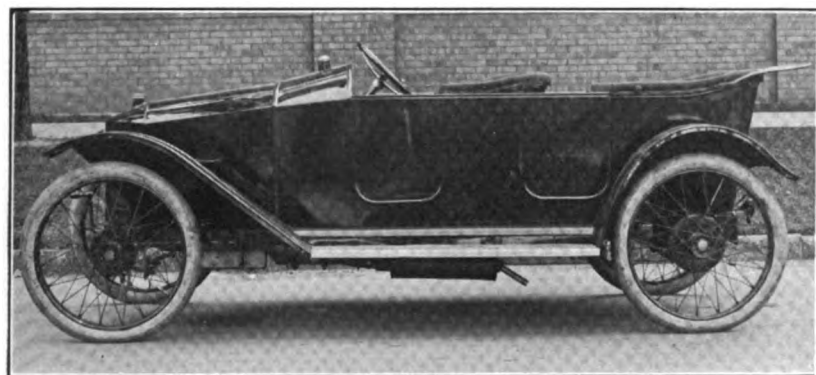
#### Motor.

The power plant is an important feature, and one upon which there is some little difference of opinion among engineers. An automobile built along the simplest lines has been taken by some to mean the use of motorcycle parts so far as practicable. This has



The Underslung Suspension Is Particularly Noticeable with the Mercury.

continue to disagree for some time. The advocates of the two-cylinder power plant point to the motorcycle as an example of the efficiency of this type of motor in hill climbing and similar work.



The Car-Nation Offers an Option Between Tandem and Side-by-Side Seats.

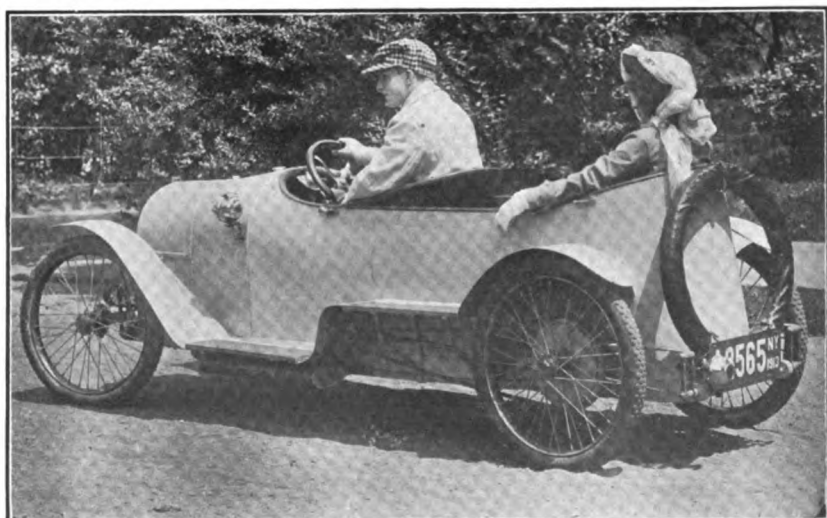
undoubtedly had its effect upon the selection of a two-cylinder motor of the motorcycle type in many instances. Generally, however, it has been found desirable to redesign the engine so as to make it particularly adaptable to cyclecar service.

#### Two vs. Four Cylinders.

Since road conditions are not the same in America that they are abroad, the question of power has given rise to the difference of opinion mentioned above. Some engineers hold that a two-cylinder engine is quite suitable for town driving and for work where the country is comparatively level, and that a four-cylinder motor will be found more desirable where hills and poor roads are to be encountered. This is a point concerning which it is expected that engineers and owners will

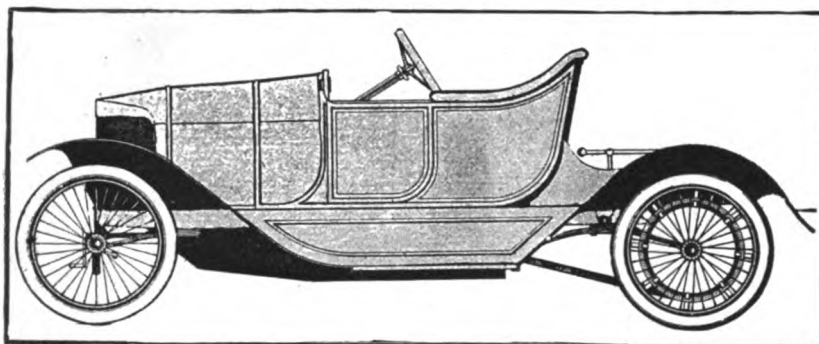
Twenty American cyclecar manufacturers list a two-cylinder motor only, but it is known that several of these are experimenting with four-cylinder engines and expect to be in a position to offer an option in this respect. Three makers already offer such an option. Ten stand committed to the four-cylinder engine from the start. The horsepower rating—and the figures given are those of the manufacturer in each instance—ranges from eight to 19. Cooling, Etc.

Of the 24 two-cylinder motors listed, all are air-cooled, and generally these are V type. One



Still Another Design with Tandem Seating Is That of the Twombly.





**The Fenton Follows the Roadster Design with Rear Deck for Luggage.**

four-cylinder motor is air-cooled, but the other 10 are water-cooled. Information concerning the lubrication system is somewhat meager, but the choice seems to be divided between pump circulation and gravity. Except in a few instances, where the Atwater Kent Unisparker system is employed, ignition is by high-tension magneto.

#### **Location.**

The location of the power plant follows general automobile practise in most instances, in that it is placed in front, usually under a hood. The Imp and Pioneer leave the motor somewhat exposed, the hood being so arranged as to deflect the air currents about the engine in front of it. A notable exception to the general rule is found in the Cricket, which carries its two-cylinder engine at the right side of the car, entirely exposed.

The transmission system is divided between friction, selective sliding gear and planetary. The Twombly offers an option in this respect, its two-cylinder model having a friction transmission and its four-cylinder a selective gearset. Sixteen makers employ the friction type, nine the selective and seven the planetary. Several of the friction driven machines are fitted with some means for limiting the number of speeds, al-

though it is possible to secure any number of speeds with this type of transmission. Some of those employing the selective type also limit the number of forward speeds to two.

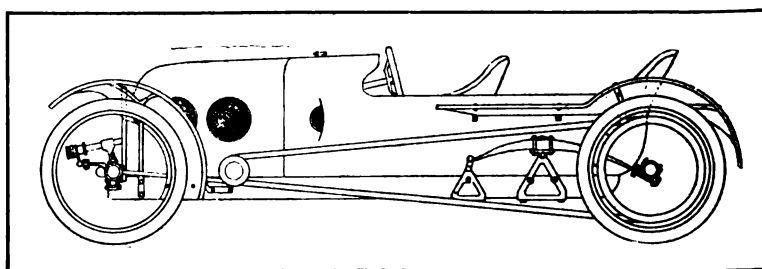
#### **Rear Construction.**

Drive to the rear wheels is by belt, chain or shaft. This naturally leads to the question of rear axle, and in this particular the cyclecar may differ materially from the automobile. The Cricket

has no rear axle, and several have no front axle. A large majority have no differential.

#### **Spring Suspension.**

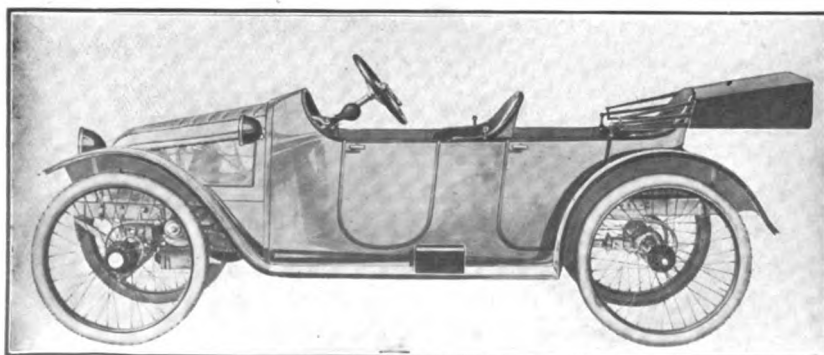
Designers have striven to produce a machine with low centre of gravity, believing that it is possible in this manner to overcome any tendency toward tipping or leaving the road when travelling at high speeds. For this reason many machines have some type of underslung springs.



**The Malcolm Machine Presents Decidedly Novel Body Lines.**

While the terms semi-elliptic, quarter-elliptic, three-quarter elliptic, cantilever, etc., are used in this connection, it does not necessarily follow that these have exactly the same meaning as with the ordinary automobile.

There is greater diversity with respect to the spring suspension than with any other one point in the design of the American cyclecars. Several concerns utilize their own special type of spring, which has been made the subject of application for patent rights. This also explains the fact that many machines are without the customary front axle. To attempt to describe each method of spring suspension in detail would require more space than has been allotted to this entire subject, but it may be dismissed briefly with the statement that the front springs are so arranged in combination with the steering



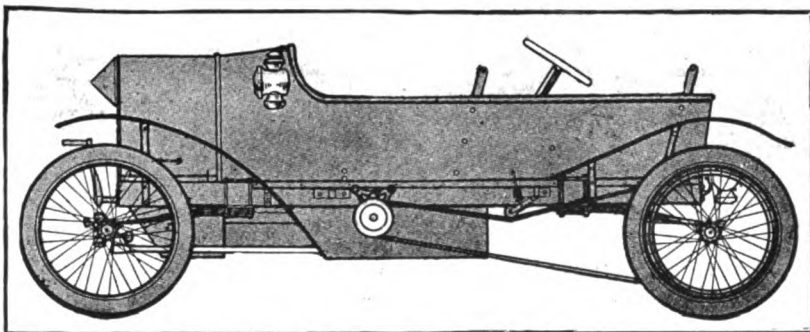
**The Woods Moblette Has Narrowest Tread of All—30 Inches.**



mechanism as to afford not only a spring suspension of the body, but the proper relation of the front wheels to each other. This also applies in a measure with respect to the rear wheels on some cyclecars.

#### Wheels and Tires.

The wheels usually are of wire, motorcycle type, the two exceptions in the tabulation being the Detroit and the Duryea, which are of wood. This also indicates that the tires are of the motorcycle type, in a majority of cases 28 inches in diameter, with cross section of 2.5, 2.75 or three inches. This is held to be an important factor in the cost of maintenance. The weight of the machine and the simplicity of its construction are expected to make for economy in fuel consumption and tire



The De Cross Cy Car Is One of the Three with Driver at the Rear.

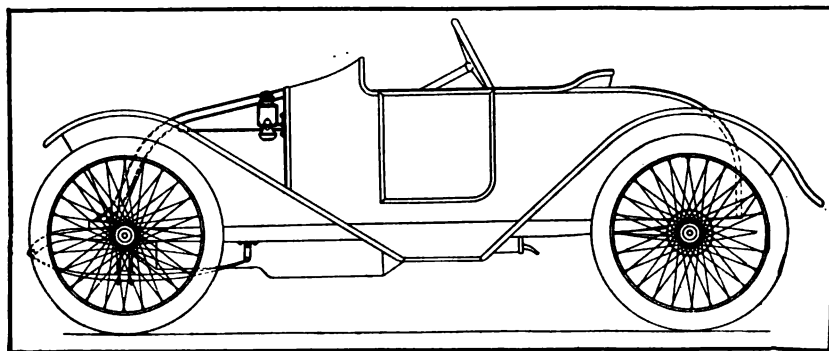
Downing, Imp, Pioneer, Trumbull, Victor and Woods. Means for starting from the seat are provided with the Falcon, Pioneer and Trumbull, and these, with the Car-Nation, also provide for electric lighting. The possibilities of using the cyclecar as a parcel delivery vehicle also have been considered by some designers, and

bodies of this type are supplied by the Economycar, Imp, Stickney and Woods. It is possible that other concerns than those mentioned have considered the starting, lighting and delivery body propositions, but the information given is that which is at hand at the present writing.

#### Still Experimenting.

But few manufacturers are as yet able to make deliveries, at least in anything like the quantity which appears to be necessary

to meet the demand for the cyclecar. This branch of the industry is hardly more than six months old, insofar as America is concerned. There are numerous problems which must be met by the designers and engineers before the actual work of manufacturing can be begun. Some of these can be determined only after a satisfactory period of road tests, which are now under way.



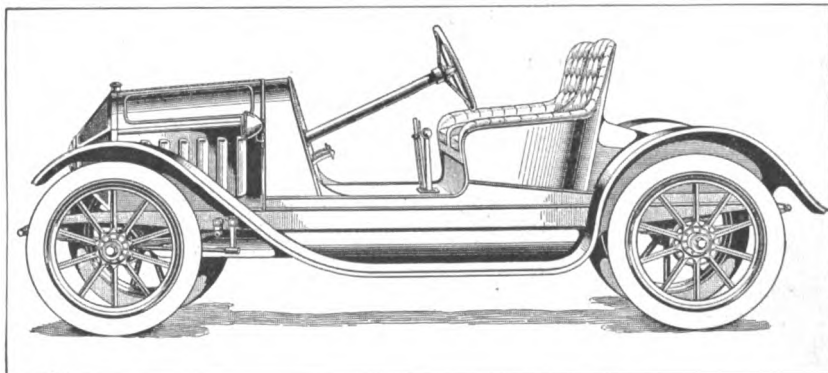
The Little Pri ncess Is Another Machine with Distinctive Body Design.

wear. The size of the tires makes for minimum first cost, as well.

#### Equipment.

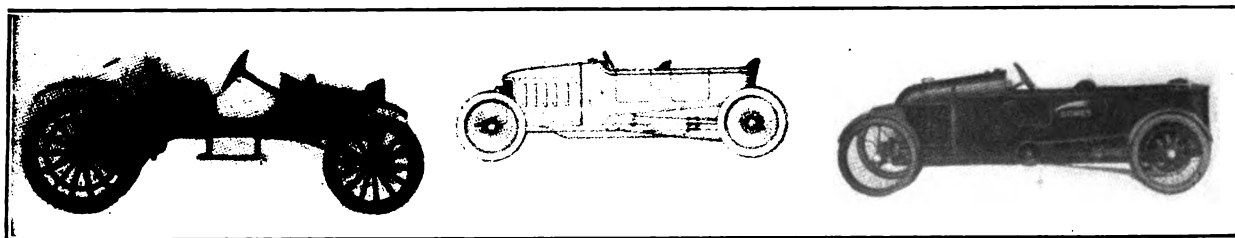
The prices given are for the machine with standard equipment, and, of course, the amount of equipment included in that term varies. Other fittings are considered as extras. Usually, however, standard equipment includes lamps and horn, tire repair outfit, pump and such small tools as may be required. Sometimes the top, windshield and side curtains are added; at others these are considered as extras.

It is maintained that the possibility of utilizing a top gives the cyclecar a decided advantage over the motorcycle and sidecar, and among the makes with which a top is furnished, either as standard or extra equipment, are the Detroit,



The Little Detroit Speedster Is One of the Two with Wood Wheels.





From Left to Right: Duryea, with Seats Side by Side and Wood Wheels; Economycar and Comet, Both Tandem.

## TABULATED LIST OF SPECIFICATIONS FOR THE VARIOUS

| Make        | Seats        | W.    | B. | Trd. | Wgt. | Cy.  | Bore | Stroke | H. | P. | Cooling | Lubrica-<br>tion | Carburetor | Ignition | Trans-<br>mission |
|-------------|--------------|-------|----|------|------|------|------|--------|----|----|---------|------------------|------------|----------|-------------------|
| Ajax        | side by side | ..    | .. | ..   | ..   | 4    | 2.20 | 3.80   | 10 | .. | water   | pump             | special    | .....    | friction          |
| Brown       | side by side | 96    | 44 | 600  | 2    | ..   | ..   | ..     | 10 | .. | air     | .....            | Schebler   | Bosch    | friction          |
| Car-Nation  | side by side | 104   | 48 | 1050 | 4    | 3.12 | 3.75 | ..     | .. | .. | water   | pump             | Car-Nation | .....    | selective         |
| Car-Nation  | tandem       | 104   | 48 | 1150 | 4    | 3.12 | 3.75 | ..     | .. | .. | water   | pump             | Car-Nation | .....    | selective         |
| Comet       | tandem       | 100   | 36 | ..   | 2    | 3.50 | 3.67 | 10     | .. | .. | air     | .....            | Schebler   | Bosch    | planetary         |
| Cornellian  | side by side | 100   | 56 | 450  | 2    | 2.37 | 2.90 | ..     | .. | .. | .....   | .....            | .....      | .....    | selective         |
| Cricket     | side by side | 82    | 46 | ..   | 2    | 3.25 | 3.60 | 8      | .. | .. | air     | .....            | .....      | .....    | selective         |
| Davis       | tandem       | 93    | 36 | 475  | 2    | 3.50 | 3.67 | 10     | .. | .. | air     | .....            | Schebler   | Bosch    | selective         |
| Dayton      | tandem       | 104   | 36 | 550  | 2    | 3.50 | 3.62 | 9-13   | .. | .. | air     | .....            | Schebler   | Bosch    | friction          |
| Dayton      | side by side | 104   | 36 | 550  | 2    | 3.50 | 3.62 | 9-13   | .. | .. | air     | .....            | Schebler   | Bosch    | friction          |
| De Cross    | tandem       | 98    | 36 | ..   | 2    | 3.50 | 3.62 | 10-12  | .. | .. | air     | .....            | Schebler   | Bosch    | friction          |
| Detroit     | side by side | 92    | 44 | ..   | 4    | 2.75 | 4.00 | 12     | .. | .. | water   | gravity          | Schebler   | Bosch    | selective         |
| Downing     | side by side | 103   | 56 | 670  | 2    | 3.50 | 3.67 | 12     | .. | .. | water   | gravity          | Schebler   | Bosch    | selective         |
| Downing     | side by side | 103   | 56 | 670  | 4    | 2.75 | 4.12 | 18     | .. | .. | water   | pump             | Schebler   | Bosch    | selective         |
| Dudly       | staggered    | 96    | 40 | 500  | 2    | ..   | ..   | 10-13  | .. | .. | air     | .....            | Schebler   | At. Kent | planetary         |
| Duryea      | side by side | 102   | .. | ..   | 2    | 3.75 | 3.75 | 19     | .. | .. | air     | .....            | Heitger    | option   | friction          |
| Economycar  | tandem       | 106   | 36 | 393  | 2    | 3.50 | 3.62 | 8-10   | .. | .. | air     | gravity          | Schebler   | Bosch    | planetary         |
| Falcon      | staggered    | 96    | 36 | 325  | 2    | 3.37 | 3.90 | 10     | .. | .. | air     | .....            | Heitger    | .....    | friction          |
| Faultless   | staggered    | 100.5 | 36 | ..   | 2    | 3.37 | 3.87 | ..     | .. | .. | air     | .....            | .....      | .....    | friction          |
| Fenton      | side by side | 96    | 36 | 500  | 2    | 3.50 | 3.67 | 10     | .. | .. | air     | pump             | Schebler   | Bosch    | friction          |
| Imp         | tandem       | 100   | 36 | 600  | 2    | 3.50 | 3.67 | 10-15  | .. | .. | air     | pump             | Schebler   | Bosch    | friction          |
| Lavigne     | side by side | 96    | 50 | 600  | 4    | ..   | ..   | ..     | .. | .. | air     | .....            | Schebler   | Bosch    | selective         |
| Los Angeles | side by side | 102   | 44 | 450  | 2    | 3.37 | 3.87 | 10     | .. | .. | air     | pump             | .....      | .....    | friction          |
| Los Angeles | side by side | 102   | 44 | 500  | 4    | 2.50 | 3.50 | 12-15  | .. | .. | water   | pump             | .....      | .....    | friction          |
| Malcolm     | tandem       | 100   | 36 | 560  | 2    | ..   | ..   | 10-15  | .. | .. | air     | pump             | special    | .....    | friction          |
| Mercury     | tandem       | 100   | 36 | ..   | 2    | 3.50 | 3.50 | 9.8    | .. | .. | air     | gravity          | Schebler   | Bosch    | friction          |
| Pioneer     | staggered    | 96    | 40 | 500  | 2    | 2.87 | 4.00 | 12-15  | .. | .. | air     | pump             | Schebler   | Briggs   | friction          |
| Princess    | side by side | 86    | 44 | 725  | 4    | 2.75 | 3.87 | 12     | .. | .. | air     | pump             | Holley     | Bosch    | planetary         |
| Puritan     | side by side | 108   | 42 | 550  | 2    | ..   | ..   | 10     | .. | .. | air     | .....            | .....      | .....    | planetary         |
| Rayfield    | .....        | 96    | .. | ..   | 4    | 2.75 | 4.50 | 12     | .. | .. | water   | .....            | Rayfield   | Bosch    | selective         |
| Rocket      | tandem       | 100   | 36 | 650  | 2    | 3.50 | 3.67 | 10-12  | .. | .. | air     | gravity          | Schebler   | At. Kent | planetary         |
| Stickney    | tandem       | 120   | 40 | ..   | 4    | 2.75 | 5.00 | 12-15  | .. | .. | water   | .....            | Schebler   | Bosch    | friction          |
| Trumbull    | side by side | 80    | 44 | 650  | 4    | 2.87 | 4.00 | 14-18  | .. | .. | water   | pump             | .....      | At. Kent | friction          |
| Twombly     | tandem       | 96    | 38 | ..   | 2    | ..   | ..   | 10     | .. | .. | air     | .....            | .....      | Bosch    | friction          |
| Twombly     | tandem       | 102   | 38 | ..   | 4    | ..   | ..   | 15     | .. | .. | water   | .....            | .....      | Bosch    | selective         |
| Victor      | side by side | 98    | .. | ..   | 4    | 3.37 | 3.75 | 18     | .. | .. | water   | .....            | Breeze     | Berling  | selective         |
| Woods       | tandem       | 98    | 30 | 450  | 4    | 2.68 | 2.93 | 14     | .. | .. | air     | pump             | .....      | .....    | planetary         |
| Zip         | side by side | 92    | 40 | 600  | 2    | 3.37 | 3.90 | 10-14  | .. | .. | air     | .....            | Schebler   | At. Kent | friction          |

\*Any number; †front, 28x2½ rear; ‡front, 30x3 rear.

### MAKERS OF CYCLECARS LISTED ABOVE.

**Ajax**—Briscoe Freres, New York City.

**Brown**—Brown Cyclecar Car Company, Asbury Park, N. J.

**Car-Nation**—American Volturette Company, Detroit.

**Comet**—Comet Cyclecar Company, Indianapolis, Ind.

**Cornellian**—Cornellian Company, Kalamazoo, Mich.

**Cricket**—Cricket Cyclecar Company, Detroit.

**Davis**—Davis Cyclecar Company, Detroit.

**Dayton**—Dayton Cyclecar Company, Joliet, Ill.

**De Cross**—De Cross Cy Car Company, Cleveland, O.

**Detroit**—Detroit Cycle Car Company, Detroit.

**Downing**—Downing Cycle Car Company, Detroit.

**Dudly**—Dudly Tool Company, Menominee, Mich.

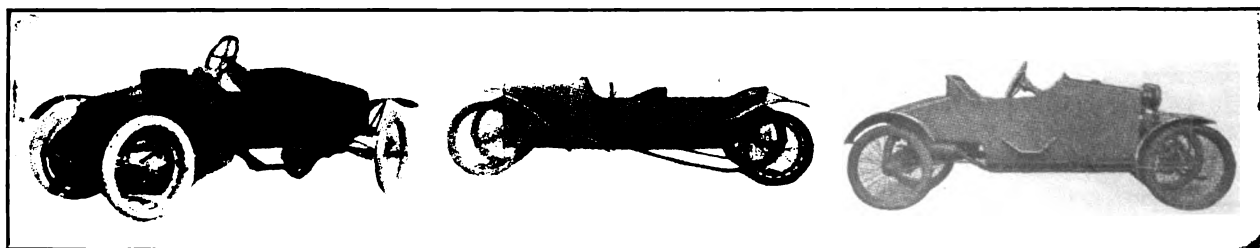
**Duryea**—Duryea Motor Company, Saginaw, Mich.

**Economycar**—Economycar Company, Indianapolis, Ind.

**Falcon**—Falcon Cyclecar Company, Staunton, Va.

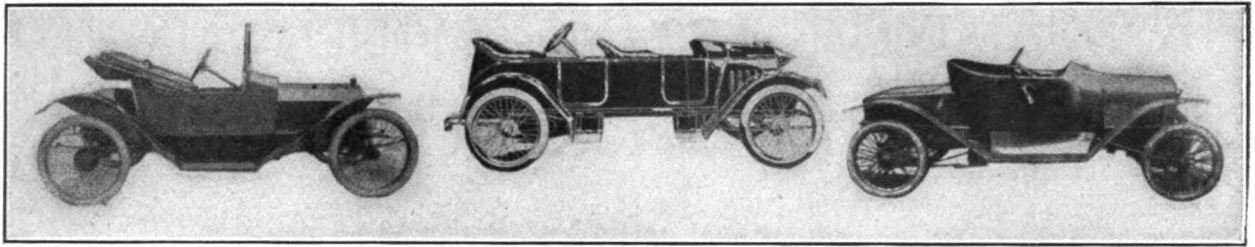
**Faultless**—Valley Boat & Engine Company, Saginaw, Mich.

**Fenton**—Fenton Cycle Car Company, Fenton, Mich.



From Left to Right: Zip, with Seats Side by Side; Dayton, Tandem, and Cornellian, with Passengers Side by Side.





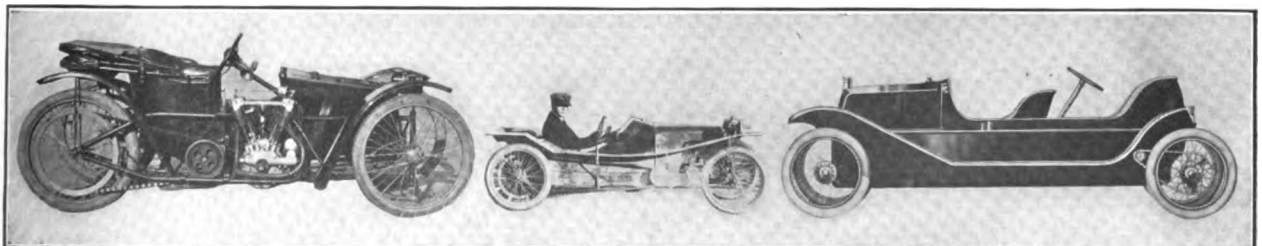
From Left to Right: Victor, Seating Side by Side; Davis, Tandem, with Driver at the Rear, and Ajax, Side by Side.

## MODELS OF CYCLECARS NOW ON THE AMERICAN MARKET.

| Speeds Drive | Ser. Brake   | Emer. Brake | Front Springs | Rear Springs | Rear Axle     | Differential | Wheels | Tires      | Price |
|--------------|--------------|-------------|---------------|--------------|---------------|--------------|--------|------------|-------|
| .. chain     | .....        | .....       | .....         | .....        | .....         | ....         | wire   | 26x2 1/2   | \$380 |
| .. chain     | .....        | .....       | .....         | .....        | dead          | no           | wire   | 28x2 3/4   | 375   |
| 3 shaft      | shaft        | wheels      | cantilever    | cantilever   | semi-floating | yes          | wire   | 30x3       | 495   |
| 3 shaft      | shaft        | wheels      | cantilever    | cantilever   | semi-floating | yes          | wire   | 30x3       | 510   |
| 2 chain      | .....        | .....       | .....         | .....        | dead          | no           | wire   | 28x3       | 400   |
| 2 belt       | .....        | .....       | .....         | .....        | semi-floating | yes          | wire   | 28x3       | 400   |
| 2 V belt     | .....        | .....       | spiral        | 1/2-elliptic | none          | no           | wire   | 28x2 1/2 † | 375   |
| 3 chain      | .....        | .....       | .....         | .....        | dead          | ....         | wire   | 28x2 1/2   | 425   |
| 5 V belt     | wheels       | wheels      | 1/2-elliptic  | 1/2-elliptic | dead          | no           | wire   | 28x2 1/2   | 375   |
| 5 V belt     | wheels       | wheels      | 1/2-elliptic  | 1/2-elliptic | dead          | no           | wire   | 28x2 1/2   | 375   |
| .. belt      | .....        | .....       | 1/4-elliptic  | 1/4-elliptic | dead          | no           | wire   | 28x2 3/4   | 385   |
| 2 shaft      | .....        | .....       | .....         | .....        | dead          | yes          | wood   | 28x3       | 375   |
| 2 shaft      | wheels       | wheels      | 1/2-elliptic  | 1/2-elliptic | semi-floating | yes          | wire   | 28x3       | 450   |
| 3 shaft      | wheels       | wheels      | 1/2-elliptic  | 1/2-elliptic | semi-floating | yes          | wire   | 28x3       | 480   |
| 2 V belt     | block        | wheels      | 1/2-elliptic  | 1/2-elliptic | dead          | no           | wire   | 28x3       | 385   |
| ..           | .....        | .....       | .....         | .....        | dead          | ....         | wood   | 30x3       | 450   |
| 2 V belt     | .....        | .....       | .....         | .....        | dead          | no           | wire   | 28x3       | 425   |
| .. V belt    | wheels       | wheels      | special       | special      | dead          | no           | wire   | 28x3       | 385   |
| .. V belt    | .....        | .....       | .....         | .....        | dead          | no           | wire   | 29x2 3/4   | ...   |
| * V belt     | .....        | .....       | 1/2-elliptic  | 1/2-elliptic | dead          | no           | wire   | 26x2 1/2   | 375   |
| 4 V belt     | block        | friction    | transverse    | transverse   | dead          | no           | wire   | 28x2 1/2   | 375   |
| .. shaft     | .....        | .....       | 1/2-elliptic  | 1/2-elliptic | floating      | yes          | wire   | .....      | 425   |
| 4 belt       | countershaft | wheels      | 1/2-elliptic  | 1/2-elliptic | dead          | no           | wire   | 28x2 3/4   | 395   |
| 4 chain      | countershaft | wheels      | 1/2-elliptic  | 1/2-elliptic | dead          | no           | wire   | 28x2 3/4   | 475   |
| * V belt     | block        | friction    | platform      | cantilever   | dead          | no           | wire   | 28x2 1/2   | 395   |
| .. V belt    | .....        | .....       | 1/2-elliptic  | cantilever   | dead          | no           | wire   | 28x2 1/2   | 375   |
| 4 belt       | block        | friction    | 1/2-elliptic  | 1/2-elliptic | dead          | no           | wire   | 28x2 1/2   | 385   |
| 2 shaft      | shaft        | wheels      | 1/2-elliptic  | cantilever   | semi-floating | yes          | wire   | 28x3       | 395   |
| 2 shaft      | .....        | .....       | 1/2-elliptic  | 1/4-elliptic | dead          | no           | wire   | 28x3       | 350   |
| .. belt      | .....        | .....       | .....         | .....        | semi-floating | yes          | wire   | 28x3       | 375   |
| 2 shaft      | wheels       | wheels      | 1/2-elliptic  | 1/4-elliptic | dead          | yes          | wire   | 28x3       | ...   |
| .. chain     | jackshaft    | wheels      | 1/2-elliptic  | 1/2-elliptic | dead          | no           | wire   | 28x3       | 395   |
| 4 chain      | wheels       | wheels      | 1/2-elliptic  | 1/2-elliptic | dead          | no           | wire   | 28x3       | 425   |
| .. chain     | .....        | .....       | .....         | .....        | dead          | no           | wire   | 28x3       | ...   |
| 3 shaft      | .....        | .....       | .....         | .....        | floating      | yes          | wire   | 28x3       | ...   |
| .. belt      | .....        | .....       | .....         | .....        | floating      | yes          | wire   | 30x3 1/4 † | 500   |
| 2 shaft      | wheels       | wheels      | 1/2-elliptic  | cantilever   | floating      | yes          | wire   | 28x2 1/2   | 385   |
| .. V belt    | .....        | .....       | .....         | .....        | dead          | no           | wire   | 28x2 1/2   | 395   |

**Imp**—Imp Cyclecar Company, Auburn, Ind.  
**Lavigne**—J. P. L. Cyclecar Company, Detroit.  
**Los Angeles**—Los Angeles Cycle Car Company, Los Angeles, Cal.  
**Malcolm**—Malcolm Jones Detroit Company, Detroit.  
**Mercury**—Mercury Cyclecar Company, Detroit.  
**Pioneer**—American Manufacturing Company, Chicago, Ill.  
**Princess**—Princess Cyclecar Company, Detroit.  
**Puritan**—Puritan Motor Company, Chicago, Ill.  
**Rayfield**—Rayfield Motor Company, Chrisman, Ill.

**Rocket**—Scripps-Booth Cyclecar Company, Detroit.  
**Stickney Motorette**—Charles A. Stickney Company, St. Paul, Minn.  
**Trumbull**—American Cyclecar Company, Bridgeport, Conn.  
**Twombly**—Twombly Motors Company, New York City.  
**Victor**—Victor Motor Car Company, Philadelphia, Penn.  
**Woods Mobillette**—Woods Mobillette Company, Chicago, Ill.  
**Zip**—Zip Cyclecar Company, Davenport, Ia.



From Left to Right: Cricket, with Motor at the Side; Dudley, with Staggered Seating, and Stickney, Driver at Rear.



## ANNUAL IMPORTERS' AUTOMOBILE SALON.

**D**EALERS representing imported automobiles in New York City are divided in their opinion as to the American demand for light cars of foreign manufacture. Perhaps it is due to the fact that the new tariff has been in force a short time only, but the importers state that it has not as yet made any appreciable effect upon their business. These factors are to be borne in mind when considering the annual Importers' Automobile Salon, to be given under the auspices of the Importers' Automobile Alliance in the grand ball room of the Hotel Astor, New York City, Jan. 2-10.

The list of exhibitors this year is a record one, both as to number of makes of cars and countries represented. There are 13 of the former and six of the latter, with a strong probability that these will become 14 and seven, respectively. In addition, the work of two body makers will be shown as separate displays. A distinct innovation this year is an accessory division, in which five makers of tires and two of accessories will be represented.

The Importers' Automobile Alliance departed from its usual custom last year in admitting cars of American manufacture. The United States will be one of the six or seven nations represented this year, the cars being the S. G. V. and the Simplex. The foreign machines that will be shown are: De Dion-Bouton, Delaunay-Belleville and Peugeot from France; Benz and Minerva from Germany; Fiat, Isotta-Fraschini and Lancia from Italy; Bugatti and Minerva from Belgium, and Marshall-Arter from England. It is expected that Spain also will be represented by the Hispano-Suiza, an agency for which is about to be established in New York.

Four nations are listed among the exhibitors of tires, these being France with the Gaulois and Faure, Great Britain with the Dunlop, Belgium with the Englebert and Russia with the Prowodnik. Dunlop wire wheels also will be displayed in this section, and A. J. Pickard will present a very complete line of supplies and fittings produced abroad.

The tariff will have at least one important bearing upon the forthcoming Salon, because by its terms cars and accessories may be admitted free of duty for exhibition purposes during the period of six months. This is expected to have a decided effect upon the number and character of the models shown, since under the terms of the old law the exhibitor was forced to pay a duty of

45 per cent. on each chassis and body, whereas now he has only the freight to consider. The variety of imported bodies to be seen at this display therefore promises to be somewhat wider than heretofore, although the Importers' Salon always has been noted for the body appointments revealed.

Although the grand ball room of the Hotel Astor provides over 20,000 square feet of floor space, it is anticipated that this will be taxed to its utmost. As heretofore, there will be no attempt to add to the beautiful decorations of this interior, which furnishes such an ideal setting for the cars. The committee in charge of the event plans to make it just as much of a drawing room affair as its predecessors and everything necessary will be done to create the atmosphere of social exclusiveness, particularly as it is believed by the importers that this appeals to the class of people who are interested in the foreign machines.

It may be added that the Bugatti and Marshall-Arter cars are entirely new to America, as of course is the Hispano-Suiza, although the reputation of the last named is somewhat well known in this country. The Belgian and English products are light cars. The former has been on the market since 1910 and has played a prominent part in racing events on the Continent. The Marshall-Arter is made in several models, ranging in horsepower from 8-10 to 12-14, with two and four-cylinder motors.

It also is stated that one, and perhaps two, cyclecars will be shown. It is practically certain that the Peugeot is one of these. This is termed a Baby Peugeot and is rated at six horsepower, with four-cylinder motor, cast en bloc, having bore of 55 mm and stroke of 90 (2.16 by 3.54 inches). The wheelbase is 72 inches and the two passengers are seated side by side.

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At its annual meeting in the Lexington hotel, Chicago, Dec. 17, the Chicago Garage Owners' Association elected the following officers: President, J. A. Cameron; vice president and chairman of the electric division, H. J. Murphy; vice president and chairman of the gasoline garage division, W. C. Bode; vice president and chairman of the livery division, Fred M. Johns; vice president and chairman of the associate members' division, P. R. Higgenbotham; treasurer, John W. Morsbach; secretary, H. S. Gilbert.



# EFFECT OF CROPS ON AUTOMOBILE SALES.

(By J. J. Cole.)

**A**N ANALYSIS of crop conditions in the United States for 1913 discloses abundant evidence of the prosperity of the nation and holds forth an optimistic future for the automobile industry. Figures compiled by the federal Department of Agriculture show that the total wealth produced from farm lands during the current year amounts to approximately \$9,000,000,000.

Since upon our agricultural conditions depends largely the general prosperity of the country, it is only logical that automobile men should look forward to an exceptional trade. When the vast crops are finally turned into money, and this wealth put into general circulation, the motor car business will, in the natural course of events, participate in the prevailing prosperity.

Comparative figures give a comprehensive idea of the increase in crops. They show the steady manner in which greater wealth is being produced from the ground each year. The fact that crops alone show an increase of \$182,054,000 over 1912, when there was an unusually large yield all over the country, is proof of the further development of the resources of the country.

The following table is taken from Secretary Houston's report:

| Crop                 | 1911 Value      | 1912 Value      | 1913 Value      |
|----------------------|-----------------|-----------------|-----------------|
| Corn .....           | \$1,565,285,000 | \$1,520,454,000 | \$1,692,092,000 |
| Cotton .....         | 660,566,000     | 780,224,000     | 797,841,000     |
| Hay .....            | 784,926,000     | 856,695,000     | 797,077,000     |
| Wheat .....          | 543,063,000     | 555,280,000     | 610,124,000     |
| Oats .....           | 414,663,000     | 452,469,000     | 439,596,000     |
| Potatoes .....       | 233,778,000     | 212,550,000     | 227,902,000     |
| Tobacco .....        | 85,210,000      | 104,063,000     | 121,587,000     |
| Barley .....         | 139,182,000     | 112,957,000     | 95,731,000      |
| Rye .....            | 27,557,000      | 23,636,000      | 26,220,000      |
| Sweet potatoes ..... | 41,202,000      | 40,264,000      | 42,884,000      |
| Sugar beets...       | 27,843,000      | 30,406,000      | 34,420,000      |
| Rice .....           | 18,274,000      | 23,423,000      | 22,090,000      |
| Flaxseed .....       | 35,272,000      | 32,202,000      | 21,399,000      |
| Buckwheat ...        | 12,735,000      | 12,720,000      | 10,445,000      |
| Totals.....          | \$4,589,556,000 | \$4,757,343,000 | \$4,939,408,000 |

Despite the fact that 1912 recorded one of the most wonderful farm yields in America's history, the increase shown this year is considerably greater than that of 1912 over 1911. In 1912 there was a total increase of \$167,787,000 over the 1911 harvest. The increase this year over 1912 amounts to \$182,065,000.

Investigation reveals the fact the highest prices in years now prevail. This condition, of course, indicates even greater prosperity for the numerous classes engaged in producing and selling crops. We find that in instances where any shortage in production occurred, the prevailing prices more than made up for the poorer yield.

This year recorded the greatest wheat production in the country's history. Cotton, tobacco, rye, corn, potatoes, sugar beets and sweet potatoes—all ranked among America's leading crops—brought considerably greater value than last year. General conditions considered, there is every reason to hold an optimistic brief for the future. Crop conditions, steadily increasing orders and the general increase in prosperity hold forth a bright hue for those engaged in the automobile business.

The South and Southwest offer wonderful possibilities. Crops in these sections have been unusually abundant.

Prices are considerably higher than has been the rule. These districts will absorb a great deal more than their share of the 1914 output.

During the first quarter of the present season, more cars by thousands were shipped than in the same period of the previous season. Our

sales, for instance, showed an increase of more than \$1,000,000 over the same period of the 1913 season. I can see no good reason why the same conditions should not obtain later.

By studying the report of farm land wealth quoted above, one can readily see the general prosperity in the country. And with this evidence of wealth, I can see no reason why the remainder of the season should not be equally prosperous. The majority of automobile manufacturers never have been able to take care of the spring demand.

Taking the season to date as a whole, it has been a prosperous one. I am sure that when spring and summer sales have been totalled the same truth will hold. I am sure that the 1914 season will go down in automobile history as being a very successful and a very prosperous one.



J. J. Cole, President, Cole Motor Car Company.



### A GOOD BUSINESS YEAR.

#### President Kissel Finds Much Reason for Optimism as to the Future.

President George A. Kissel of the Kissel Motor Car Company, Hartford, Wis., finds that, in spite of many disquieting predictions to the contrary, the year 1913 has been an excellent one in the automobile trade. He adds that there is nothing in the present situation that does not justify satisfaction with the past and optimism as to the future. Concerning KisselKars, he says:

We have achieved some splendid results this year. We have increased the business of most of our 11 factory branches over 1912—in one case as much as 105 per cent.—and added materially to our list of agents in 18 states, while our total representation decreased in only four.

During the year the Pacific KisselKar branch was formed with a capital stock of \$500,000, and the strongest organization in the far West. This company succeeded the Standard Motor Car Company, an old and very stable concern of the highest reputation. Another event of much importance was the opening of the Chicago service building at Wabash avenue and 26th street, the largest structure in the West devoted to the sale and care of one make of car.

We operated both of our factories continuously through last summer, something quite extraordinary in the automobile business, but entirely justified by the early demand for new models. During the 12 months we never closed our doors, excepting for the December inventory.

Besides the many domestic agencies added to our list, we have been enabled for the first time to bid for foreign business, with the result that KisselKars are now gracing the roads of eight other countries. Strong representation has been secured in Hawaii, New Zealand, Sweden and Chili, to which lands we have shipped several carloads of both pleasure cars and trucks. We are looking for a big spring business and preparing accordingly.

### SEVEN BIG RACES.

#### Contest Board Grants Sanctions for Important Events During 1914 Season.

At a meeting of the contest board of the American Automobile Association in New York City earlier in the month, sanctions were issued for seven important races during the 1914 season, as follows: May 30, 500-mile event, Indianapolis speedway; July 3-4, road races, Tacoma, Wash.; July 4, 300-mile race under the auspices of the Sioux City Auto Club and Speedway Association; July 13-14, race meet on Seattle speedway; Aug. 28-29, road races, Elgin, Ill., under the auspices of the Chicago Automobile Club; Sept. 9, road race, Corona, Cal., and some time in November, the exact date to be determined later, road race from El Paso, Tex., to Phoenix, Ariz., under the auspices of the El Paso Automobile Club.

Because of the marked enthusiasm with re-

spect to the cyclecar, it was the sense of the meeting that in the modification of the contest rules for 1914, suggestions be invited from the manufacturers of this type of machine, in order that classifications and regulations governing events for these might be included. The registration fee for drivers was increased from \$2 to \$3, and that for mechanics was placed at \$2.

### TO INSTALL ELECTRIC STARTERS.

#### Maker of Jesco Equipment Establishes Service Station for Owners in Chicago.

The large demand from owners of cars manufactured prior to the days of electric starting and lighting equipment is opening a new field of work for concerns who make it a business to sell car owners appliances of this character. The Jones Electric Starter Company, Chicago, maintains that the Jesco electric starter-lighter, made by it, is particularly well adapted for installations of this kind and is establishing a chain of Jesco installation and service stations throughout the country. Among the first agencies of this kind is that located in Chicago, where work of this character will be handled by the Chicago Electric Specialties Company, 1508 Michigan avenue. A large space, to accommodate as many as 30 cars at one time, has been leased by this concern for this purpose.

### CINCINNATI SHOW PLANS.

#### Automobile Trade Association to Make Display in Union Central Building.

The Cincinnati Automobile Trade Association, composed of fully two-thirds of the dealers in that city, has selected the Union Central building as the site for its annual show, Feb. 7-14. This is said to be one of the finest fireproof structures in the world, and it will afford floor space of 30,000 square feet. The display will comprise pleasure cars, motor trucks, cyclecars, motorcycles and accessories and supplies, and it is anticipated that it will be one of the most comprehensive in every respect that has been held in this city.

The committee in charge of the arrangements is composed of the following: Chairman, Raymond Hendrickson; L. C. Denison, Robert C. Crowthers, A. L. Pachoud, Claude Wilson, Leonard G. Schreiber and L. F. Ballman. Mr. Crowthers is secretary and his address is 1815 Reading road, Cincinnati, O.



## MANY INNOVATIONS FOR NEW YORK SHOW.

**Fourteenth Annual Display Under New Management in Grand Central Palace---  
Largest Number of Makes Ever Assembled Under One Roof in the Me-  
tropolis---Cyclecars, Motorcycles and Accessories to Share the Interest.**

**F**OURTEEN years ago, the first national automobile show in New York City was held in Madison Square Garden. During those 14 years the industry has witnessed many changes. But for the first time in its history New York is to have but one national show this year and Madison Square Garden has been entirely eliminated, though not forgotten.

The 14th annual national automobile show in New York City will be held in the new Grand Central Palace, Jan. 3-10, under the auspices of the Automobile Chamber of Commerce and

under the management of Samuel A. Miles. The show committee is composed of Col. George Pope, chairman; H. C. Smith and Wilford C. Leland. About the only name that sounds familiar in connection with the New York display is that of Col. Pope, who was connected with the show committee of the old Association of Licensed Automobile

Manufacturers, and its immediate successor, the Automobile Board of Trade.

One of the statements made above needs a lit-

tle amplification. The Automobile Board of Trade had but one show last year, but it was held in two buildings, Madison Square Garden and Grand Central Palace. In fact, an independent exhibition of cars was made in the latter building in 1912. So that the Grand Central Palace has been identified with the national automobile show previous to this year.

The Automobile Chamber of Commerce is a new name for the old National Association of Automobile Manufacturers, and was selected upon the amalgamation of that organization with the

Automobile Board of Trade early in the year. It is understood that a movement is under way to change this name yet again, so that it is expected that it soon will become the National Automobile Chamber of Commerce.

Samuel A. Miles has been general manager of the national organization of automobile manufacturers for years, and is even better

known in the the Middle West as manager of all the national automobile shows held in Chicago. This is practically his first appearance as a show



**Grand Central Palace, Scene of 14th Annual National New York Display.**



manager in the East, but his experience in this respect has been such as to warrant the forecast that the exhibition will prove a success, insofar as he is able to bring this about.



Samuel A. Miles, General Manager,  
New York Show.

Examination of the advance list of exhibitors indicates that the forthcoming display will afford the people of New York City an opportunity to see the largest number of makes of motor vehicles ever assembled under one roof. In this respect, the New York exhibition

never has equalled the Boston show, but taking the number of makes shown in two buildings last year as a basis of comparison—and that was the largest number ever seen in the Metropolis—this year's list already comes within six of equalling that event. There were 87 makes in 1913 and there will be at least 81 in 1914.

These 81 makes comprise 70 gasoline, six electrics and five cyclecars. Two hundred and fifty-three makers of these machines are listed today, of which 185 are producing gasoline pleasure cars, 21 electric pleasure cars and 47 cyclecars. Probably the list of cyclecar makers is by no means complete, and it may be added that this will be the first opportunity the public has had to investigate the merits of the new type of vehicle in a display of this character. In this respect, also, the 14th annual national automobile show in New York City will be different than all of its predecessors. There also will be 12 exhibitors of motorcycles.

It is practically impossible to make prediction concerning the accessory division, for the reason that many new names always are added immediately preceding the opening of the exhibition. Thus far the list would appear to be below that of last year, when 322 separate displays were made. At present there are but 253 for 1914.

A large number of tire concerns and others prominent in the accessory field have withdrawn

from all shows this year. This has had a decided effect upon the total number of exhibitors in this section. However, this has enabled the management to allot space to many concerns which have not made display heretofore. Visitors will no doubt appreciate this opportunity to examine some of the newest fittings making for comfort, convenience or economy.

Automobiles will be staged on the first and second floors, and all of the wall spaces on the third and fourth floors have been reserved for them. Electric vehicles will be shown in the centre of the second floor, cyclecars on the third and motorcycles on the fourth. Accessory exhibits will be located on the two upper floors only. The arrangement has been with a view to encouraging a visit to each floor, so that accessory and motorcycle exhibitors will secure an added advantage in being placed close to car displays.

The interior of the new Grand Central Palace has been so designed that any elaborate decorative scheme would be entirely out of place. For this reason General Manager Miles has decided that very little special ornamentation is necessary. A simple arrangement of signs will denote the different exhibition spaces and the cars will be shown amid a floral setting that will add to rather than detract from the beauty of the building itself.

Following a plan which was inaugurated early in the history of automobile shows, Wednesday will be known as "Society Day". In recent years it has been the custom to thus set aside two days on which

the admission price was doubled. With the crowded condition of the aisles in Madison Square Garden it was found desirable to secure the advantage of limited attendance in this manner, but Grand Central Palace affords many thousand feet of extra floor space and it is not believed

will be necessary in consequence. The show will be for one week only, and confined solely to the passenger vehicle end of the industry.



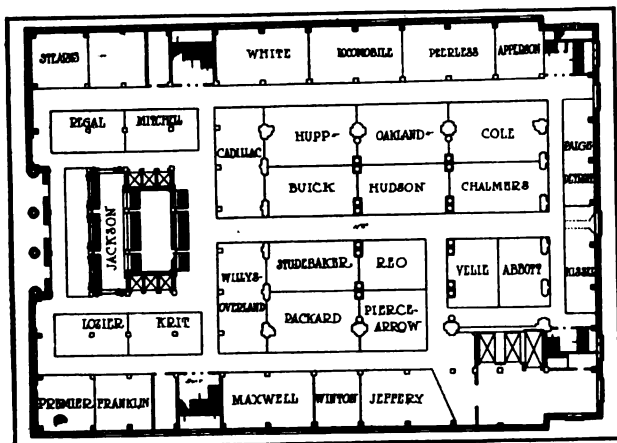
Col. George L. Pope, Chairman, New  
York Show Committee.



## CLASSIFIED LIST OF NEW YORK SHOW EXHIBITORS.

## GASOLINE PLEASURE CARS.

- A 23 Abbott-Detroit—Abbott Motor Co., Detroit, Mich.  
 D 14 Allen—Allen Motor Co., Fostoria, O.



Main Floor, Section A, Gasoline Cars Only.

- A 2 Apperson—Apperson Bros. Auto Co., Kokomo, Ind.  
 B 17 Auburn—Auburn Auto Co., Auburn, Ind.  
 A 15 Buick—Buick Motor Co., Flint, Mich.  
 A 11 Cadillac—Cadillac Motor Car Co., Detroit, Mich.  
 D 13 Cameron—Cameron Mfg. Co., West Haven, Conn.  
 B 28 Cartecar—Cartecar Co., Pontiac, Mich.  
 B 22 Case—J. I. Case T. M. Co., Racine, Wis.  
 A 17 Chalmers—Chalmers Motor Co., Detroit, Mich.  
 C 5, 6 Chandler—Chandler Motor Car Co., Cleveland, O.  
 A 14 Cole—Cole Motor Car Co., Indianapolis, Ind.  
 C 10 Davis—Geo. W. Davis Motor Car Co., Richmond, Ind.  
 C 21 Empire—Empire Automobile Co., Indianapolis, Ind.  
 B 15 Fiat—Fiat Automobile Co., Poughkeepsie, N. Y.  
 A 29 Franklin—H. H. Franklin Mfg. Co., Syracuse, N. Y.  
 B 2 Garford—Garford Co., Elyria, O.  
 B 5 Great Western—Great Western Auto Co., Peru, Ind.  
 C 11 Havers—Havers Motor Car Co., Port Huron, Mich.  
 B 23 Haynes—Haynes Automobile Co., Kokomo, Ind.  
 B 7 Henderson—Henderson Motor Car Co., Indianapolis, Ind.  
 B 20 Herreshoff—Herreshoff Motor Co., Detroit, Mich.  
 A 16 Hudson—Hudson Motor Car Co., Detroit, Mich.  
 A 12 Hupmobile—Hupp Motor Car Co., Detroit, Mich.  
 B 11 Imperial—Imperial Automobile Co., Jackson, Mich.  
 A 18 Jackson—Jackson Automobile Co., Jackson, Mich.  
 A 32 Jeffery—Thos. B. Jeffery Co., Kenosha, Wis.  
 C 18 Keeton—Keeton Motor Car Co., Detroit, Mich.  
 C 2 King—King Motor Car Co., Detroit, Mich.  
 A 8 Kissel—Kissel Motor Car Co., Hartford, Wis.  
 B 21 Kline—Kline Motor Car Corp., Richmond, Va.  
 A 25 K-R-I-T—K-R-I-T Motor Car Co., Detroit, Mich.  
 A 4 Locomobile—Locomobile Co. of America, Bridgeport, Conn.  
 A 24 Lozier—Lozier Motor Co., Detroit, Mich.  
 B 29 Marlon—Marlon Motor Car Co., Indianapolis, Ind.  
 B 1 Marmon—Nordyke & Marmon Co., Indianapolis, Ind.  
 A 30 Maxwell—Maxwell Motor Co., Detroit, Mich.  
 C 8 McIntyre—W. H. McIntyre Co., Auburn, Ind.  
 B 9 Mercer—Mercer Automobile Co., Trenton, N. J.  
 C 4 Metz—Metz Co., Waltham, Mass.  
 A 10 Mitchell—Mitchell-Lewis Motor Co., Racine, Wis.  
 B 30 Moline—Knight—Moline Automobile Co., East Moline, Ill.  
 C 14 Mondex—Magie—Aristos Co., New York, N. Y.  
 B 3 Moon—Moon Motor Car Co., St. Louis, Mo.  
 B 4 National—National Motor Vehicle Co., Indianapolis, Ind.  
 A 13 Oakland—Oakland Motor Car Co., Pontiac, Mich.  
 D 2 Ohio—Crescent Motor Co., Cincinnati, O.  
 B 8 Oldsmobile—Olds Motor Works, Lansing, Mich.  
 A 19 Overland—Willys-Overland Co., Toledo, O.  
 A 26 Packard—Packard Motor Car Co., Detroit, Mich.

- A 7 Paige—Paige-Detroit Motor Car Co., Detroit, Mich.  
 C 20 Palmer-Singer—Palmer & Singer Mfg. Co., Long Island City, N. Y.  
 C 13 Partin-Palmer—Partin Mfg. Co., Chicago, Ill.  
 B 14 Pathfinder—Motor Car Mfg. Co., Indianapolis, Ind.  
 A 5 Peerless—Peerless Motor Car Co., Cleveland, O.  
 A 27 Pierce-Arrow—Pierce-Arrow Motor Car Co., Buffalo, N. Y.  
 A 28 Premier—Premier Motor Mfg. Co., Indianapolis, Ind.  
 B 6 Pullman—Pullman Motor Car Co., York, Penn.  
 A 9 Regal—Regal Motor Car Co., Detroit, Mich.  
 A 21 Reo—Reo Motor Car Co., Lansing, Mich.  
 B 13 Speedwell—Speedwell Motor Car Co., Dayton, O.  
 A 1 Stearns-Knight—F. B. Stearns Co., Cleveland, O.  
 B 24 Stevens-Duryea—Stevens-Duryea Co., Chicopee Falls, Mass.  
 A 20 Studebaker—Studebaker Corp., Detroit, Mich.  
 B 10 Stutz—Stutz Motor Car Co., Indianapolis, Ind.  
 C 22 Vaughan—Vaughan Car Co., Kingston, N. Y.  
 A 24 Velle—Velle Motor Vehicle Co., Moline, Ill.  
 B 12 Westcott—Westcott Motor Car Co., Richmond, Ind.  
 A 3 White—White Co., Cleveland, O.  
 A 31 Winton—Winton Motor Carriage Co., Cleveland, O.

## ELECTRIC PLEASURE CARS.

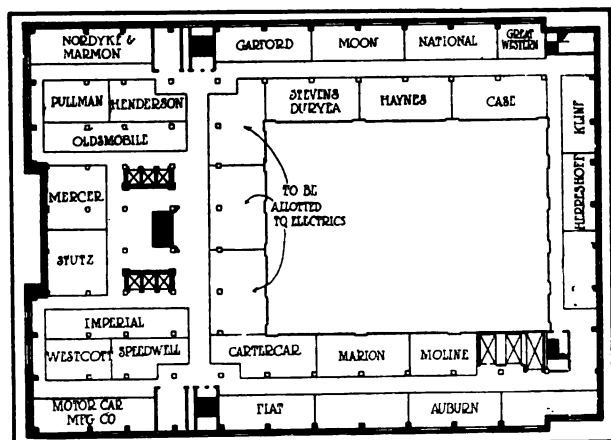
- B 27 Baker—Baker Motor Vehicle Co., Cleveland, O.  
 B 26a Detroit—Anderson Electric Car Co., Detroit, Mich.  
 B 27a Ohio—Ohio Electric Car Co., Toledo, O.  
 B 25a Rauch & Lang—Rauch & Lang Carriage Co., Cleveland, O.  
 B 25 Ward—Ward Motor Vehicle Co., New York City.  
 B 26 Waverley—Waverley Co., Indianapolis, Ind.

## CYCLECARS.

- C 7 Ajax—Briscoe Freres, New York, N. Y.  
 C 12 Cornelian—Cornelian Co., Kalamazoo, Mich.  
 C 8 Imp—Imp Cyclecar Co., Auburn, Ind.  
 C 1 Lomax—Lomax Motor Car Co., Lomax, Ill.  
 C 15 Twombly—Twombly Car Corp., New York, N. Y.

## MOTORCYCLES.

- D 151-153 Dayton—Davis Sewing Mch. Co., Dayton, O.  
 D 165-168 Emblem—Emblem Mfg. Co., Angola, N. Y.  
 D 154-159 Excelsior—Excelsior Motor Mfg. & Sup. Co., Chicago, Ill.  
 D 132-136 Flying Merkel—Miami Cycle & Mfg. Co., Midletown, O.



Second Floor, Section B, Gasoline and Electric Cars.

- D 160-164 Harley-Davidson—Harley Davidson Motor Co., Milwaukee, Wis.  
 D 190-192 Henderson—Henderson Motorcycle Co., Detroit, Mich.



- D 124-131 **Indian**—Hendee Mfg. Co., Springfield, Mass.  
 D 193-195 **Pope**—Pope Mfg. Co., Hartford, Conn.  
 D 148½-150 **R-S**—Reading-Standard Co., Reading, Penn.  
 D 171-172 **Schickel**—Schickel Motor Co., Stamford, Conn.  
 D 187-189 **Thor**—Aurora Auto. Mch. Co., Chicago, Ill.  
 D 183-186 **Yale**—Consolidated Mfg. Co., Toledo, O.

### ACCESSORIES.

#### Accessory Jobbers.

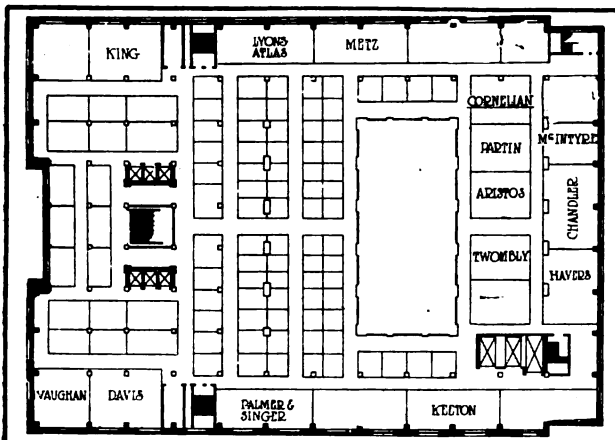
- D 66a—W. Smalley Daniels, Detroit, Mich.  
 D 31—Chas. E. Miller, New York, N. Y.  
 D 209—Ralph Walcott, New York, N. Y.  
**Axles, Transmissions, Etc.**  
 C 66—Brown-Lipe-Chapin Co., Syracuse, N. Y.  
 D 9a, 9b—Thos. Prosser & Son, New York, N. Y.  
 D 85—Torbensen Gear & Axle Co., Newark, N. J.  
 C 51—Warner Gear Co., Muncie, Ind.

#### Ball and Roller Bearings.

- D 34a—Bock Bearing Co., Toledo, O.  
 D 113, 115—Marburg Bros., New York, N. Y.  
 D 65, 66—Rhineland Machine Works Co., New York, N. Y.

#### Batteries.

- C 96, 97—Edison Storage Battery Co., West Orange, N. J.  
 C 50—Electric Storage Battery Co., Philadelphia, Penn.  
 D 84—Philadelphia Storage Battery Co., Philadelphia, Penn.  
 C 110—Vesta Accumulator Co., Chicago, Ill.



Third Floor, Section C, Cars, Cyclecars and Accessories—  
 Motorcycles and Other Cars and Accessories on Fourth  
 Floor.

- C 75, 77—Willard Storage Battery Co., Cleveland, O.  
**Bodies.**  
 D 196, 197, 198—Edward G. Budd Mfg. Co., Philadelphia, Penn.  
 C 27—Hayes Mfg. Co., Detroit, Mich.  
 C 112—Springfield Metal Body Co., Springfield, Mass.

#### Boxes, Metal.

- C 51—Globe Machine & Stamping Co., Cleveland, O.  
 C 107—Sparks, Withington Co., Jackson, Mich.

#### Brakes and Brake Lining.

- D 105a—Asbestos & Rubber Works of America, Trenton, N. J.  
 D 49, 50—H. W. Johns-Manville Co., New York, N. Y.  
 C 55, 56—Royal Equipment Co., Bridgeport, Conn.  
 D 175—Standard Woven Fabric Co., Framingham, Mass.  
 D 70, 71, 72—Thermoid Rubber Co., Trenton, N. J.

#### Bumpers.

- D 180—Essex Rubber Co., Trenton, N. J.  
 C 102, 108—J. H. Sager Co., Rochester, N. Y.

#### Carbon Removers.

- D 55, 56, 57—Cox Brass Mfg. Co., Albany, N. Y.  
 D 24a—G. B. Sales Corp., New York, N. Y.

#### Carburetors.

- C 89—Breeze Carburetor Co., Newark, N. J.  
 C 59—Byrne, Kingston Co., Kokomo, Ind.  
 D 69—Elker Carburetor Co., New York, N. Y.  
 C 98, 99—Findelsen & Kropf Mfg. Co., Chicago, Ill.  
 D 121—Schoen-Jackson Co., Media, Penn.

- C 64—Stromberg Motor Devices Co., Chicago, Ill.  
 C 41—Wheeler & Schebler, Indianapolis, Ind.

#### Castings, Etc.

- C 78, 79—American Bronze Co., Berwyn, Penn.  
 C 43—Wm. Cramp & Sons Sh. & Eng. Bldg. Co., Philadelphia, Penn.  
 C 92—Doehler Die Casting Co., Brooklyn, N. Y.  
 D 8, 8a—H. H. Franklin Mfg. Co., Syracuse, N. Y.  
 D 43—Peter A. Frasse & Co., New York, N. Y.  
 C 52—Light Mfg. & Fdy. Co., Pottstown, Penn.  
 C 80—Manufacturers Fdy. Co., Waterbury, Conn.  
 D 121—National Lead Co., New York, N. Y.  
 C 53—National Tube Co., Pittsburgh, Penn.

#### Concealed Hinges.

- D 39—Soss Mfg. Co., Brooklyn, N. Y.

#### Chains.

- D 111—Herbert F. L. Funke, New York, N. Y.  
 C 111—Link-Belt Co., Philadelphia, Penn.

#### Fire Extinguishers.

- D 54—David Kahnweiler's Sons, New York, N. Y.  
 D 61—Pyrene Mfg. Co., New York, N. Y.

#### Gasoline Gauges.

- D 49—Schaefer Sales Corp., Detroit, Mich.

#### Gear Shifters.

- D 11—Gray Pneumatic Gear Shift Co., New York, N. Y.

#### Horns and Signalling Devices.

- D 29, 30—Automobile Supply Mfg. Co., Brooklyn, N. Y.  
 C 69, 71—Dean Electric Co., Elyria, O.  
 D 36a—Fitzgerald Mfg. Co., Torrington, Conn.  
 C 44—Gabriel Horn Mfg. Co., Cleveland, O.  
 C 115—H. W. Johns-Manville Co., New York, N. Y.  
 D 112—Nonpareil Horn Mfg. Co., New York, N. Y.  
 C 90—Randall-Falchney Co., Boston, Mass.  
 D 119—Sireno Co., New York, N. Y.

#### Ignition Devices.

- C 87—Atwater Kent Mfg. Works, Philadelphia, Penn.  
 D 177—Electric Spark Appliance Co., New York, N. Y.  
 C 108—Heinze Electric Co., Lowell, Mass.  
 D 200—Herz & Co., New York, N. Y.  
 D 143—Holtzer-Cabot Co., Brookline, Mass.  
 D 207—K-W Ignition Co., Cleveland, O.  
 D 113, 114, 115—Marburg Bros., New York, N. Y.  
 C 101—Motsinger Devices Co., Lafayette, Ind.  
 C 54—National Coil Co., Lansing, Mich.  
 D 68—New York Coil Co., New York, N. Y.  
 C 36—Remy Electric Co., Anderson, Ind.  
 C 91—Simms Magneto Co., New York, N. Y.  
 C 60, 73—Splittorf Electrical Co., Newark, N. J.  
 D 142—Western Electric Co., New York, N. Y.

#### Jacks.

- C 49, 50—Hartford Suspension Co., Jersey City, N. J.  
 C 74—Oliver Mfg. Co., Chicago, Ill.

#### Lamps.

- D 174—B & L Auto Lamp Co., New York, N. Y.  
 C 46—Badger Brass Mfg. Co., Kenosha, Wis.  
 C 116—C. Cowles & Co., New Haven, Conn.  
 C 51—Edmunds & Jones Mfg. Co., Detroit, Mich.  
 D 206—Hawthorne Mfg. Co., Bridgeport, Conn.  
 D 26—Reynolds Browne Co., Chicago, Ill.  
 D 25—Roffy-Grace Corp., New York, N. Y.  
 D 19—Rushmore Dynamo Works, Plainfield, N. J.

#### License Brackets.

- D 37—Perkins-Campbell Co., Chicago, Ill.  
 C 109—Rose Mfg. Co., Philadelphia, Penn.

#### Lighting Systems.

- C 94, 95—Apple Electric Co., Dayton, O.  
 C 104, 105—Detroit Electric Appliance Co., Detroit, Mich.  
 C 68—Dyneto Electric Co., Syracuse, N. Y.  
 D 86—Electric Auto-Lite Co., Toledo, O.  
 C 26, 28—Gray & Davis, Boston, Mass.  
 C 49, 50—Hartford Suspension Co., Jersey City, N. J.  
 D 143—Holtzer-Cabot Co., Brookline, Mass.  
 D 106a—Kemco Electric Mfg. Co., Cleveland, O.  
 D 30a—North East Electric Co., Rochester, N. Y.  
 C 23, 25—U. S. Lighting & Heating Co., New York, N. Y.  
 D 28—Ward Leonard Electric Co., Bronxville, N. Y.  
 D 18—Westinghouse Electric & Mfg. Co., East Pittsburg, Penn.

#### Lubricants.

- C 58—Adam Cook's Sons, New York, N. Y.  
 C 38—Jos. Dixon Crucible Co., Jersey City, N. J.  
 C 88—A. W. Harris Oil Co., Providence, R. I.  
 C 85—Geo. A. Haws, New York, N. Y.  
 D 47—Indian Refining Co., New York, N. Y.  
 C 114—International Acheson Graphite Co., Niagara Falls, N. Y.



- C 45**—New York & New Jersey Lubricant Co., New York, N. Y.  
**D 103**—Platt & Washburn Refining Co., New York, N. Y.  
**D 98, 99**—L. Sonneborn Sons, New York, N. Y.  
**C 37**—Vacuum Oil Co., Rochester, N. Y.  
**C 63**—White & Bagley Co., Worcester, Mass.  
**Lubricators, Grease Guns, Etc.**  
**D 27**—Daim Oil Cushion Spring Insert Co., Chicago, Ill.  
**D 123**—Detroit Lubricator Co., Detroit, Mich.  
**D 31a**—Frazer Lubricator Co., Chicago, Ill.  
**C 99**—Randall-Falchney Co., Boston, Mass.  
**D 95**—S. P. Townsend & Co., Orange, N. J.  
**D 34**—Universal Lubricating Co., Cleveland, O.  
**Machinery and Machine Tools.**  
**D 60**—Baush Machine Tool Co., Springfield, Mass.  
**D 142a**—Houppert Machine Co., New York, N. Y.  
**D 33a**—Universal Machine Co., Bowling Green, O.  
**D 10**—Westinghouse Machine Co., New York, N. Y.  
**Motometers.**  
**D 77**—Motometer Co., New York, N. Y.  
**Motors.**  
**D 84**—Buda Co., Harvey, Ill.  
**D 214**—Model Gas Engine Works, Peru, Ind.  
**D 201**—F. W. Spacke Mch. Co., Indianapolis, Ind.  
**Motor Starters.**  
**C 94, 95**—Apple Electric Co., Dayton, O.  
**D 120**—Gemmer-Detroit Starter Co., Detroit, Mich.  
**C 26, 28**—Gray & Davis, Boston, Mass.  
**C 49, 50**—Hartford Suspension Co., Jersey City, N. J.  
**D 143**—Holtzer-Cabot Co., Brookline, Mass.  
**D 88**—Ignition Starter Co., Detroit, Mich.  
**D 33**—Jones Electric Starter Co., Chicago, Ill.  
**D 30a**—North East Electric Co., Rochester, N. Y.  
**D 7a, 7b**—Thurber Rotary Starter Co., Detroit, Mich.  
**C 23, 25**—U. S. Light & Heating Co., New York, N. Y.  
**D 28**—Ward Leonard Electric Co., Bronxville, N. Y.  
**D 18**—Westinghouse Electric & Mfg. Co., East Pittsburgh, Penn.  
**Motorcycle Accessories.**  
**D 217**—F. A. Baker & Co., New York, N. Y.  
**D 117**—Fentress-Newton Mfg. Co., Chicago, Ill.  
**Motorcycle Clutches, Etc.**  
**D 145, 146**—Eclipse Machine Co., Elmira, N. Y.  
**Mufflers, Cut-Outs, Etc.**  
**D 15**—Yale Steel Stamping Co., Oostburg, Wis.  
**Paints and Varnishes.**  
**C 42**—Valentine & Co., New York, N. Y.  
**D 25a**—C. A. Willey & Co., Hunter's Point, N. Y.  
**Piston Rings.**  
**D 210**—McQuay-Norris Mfg. Co., St. Louis, Mo.  
**D 85**—Wasson Piston Ring Co., Hoboken, N. J.  
**Polishes, Soaps, Etc.**  
**D 140**—N. B. Arnold, Brooklyn, N. Y.  
**D 101**—Baum's Castorine Co., Rome, N. Y.  
**D 46**—J. Eavenson & Sons, Camden, N. J.  
**D 36**—International Metal Polish Co., Indianapolis, Ind.  
**D 60a**—A. R. Justice & Co., Philadelphia, Penn.  
**D 48**—John T. Stanley, New York, N. Y.  
**Portable Garages.**  
**D 21a**—Metal Shelter Co., New York, N. Y.  
**D 15**—Taylor Mfg. Co., Montclair, N. J.  
**Pumps.**  
**D 215**—Brown Co., Syracuse, N. Y.  
**D 206**—Hawthorne Mfg. Co., Bridgeport, Conn.  
**D 199**—Kellogg Mfg. Co., Rochester, N. Y.  
**Radiators.**  
**D 213**—Mayo Mfg. Co., Chicago, Ill.  
**Recorders.**  
**D 24**—American Taximeter Co., New York, N. Y.  
**C 40**—Veeder Mfg. Co., Hartford, Conn.  
**Rims.**  
**D 33a**—E-Z Rim Co., Boston, Mass.  
**D 6b, 7**—Newmastic Co., New York, N. Y.  
**D 35**—Presto Inter-Rim Co., Boston, Mass.  
**C 34**—Standard Welding Co., Cleveland, O.  
**Shock Absorbers.**  
**D 96, 97**—Aristos Co., New York, N. Y.  
**D 89**—J. W. Blackledge Mfg. Co., Chicago, Ill.  
**D 179**—Ernst Flentje, Cambridge, Mass.  
**C 49, 50**—Hartford Suspension Co., Jersey City, N. J.  
**D 67**—Hudson Export & Import Co., New York, N. Y.  
**D 59**—J-M Shock Absorber Co., Philadelphia, Penn.  
**D 26a**—Le Telesco Shock Absorber Co., New York, N. Y.  
**D 38**—Mechaley Auto Co., Stamford, Conn.  
**D 75**—C. N. Peacock & Co., New York, N. Y.  
**C 102, 108**—J. H. Sager Co., Rochester, N. Y.  
**D 59**—Universal Shock Eliminator, Inc., New York, N. Y.  
**D 10a**—Westinghouse Air Spring Co., New York, N. Y.  
**Sidecars.**  
**D 8b, 9**—Majestic Mfg. Co., Worcester, Mass.  
**Spark Plugs.**  
**D 90**—Benford Mfg. Co., Mount Vernon, N. Y.  
**C 106**—Champion Ignition Co., Flint, Mich.  
**D 12**—Champion Spark Plug Co., Toledo, O.  
**D 62, 63, 64**—Emil Grossman Co., Brooklyn, N. Y.  
**D 81**—Hartford Machine Screw Co., Hartford, Conn.  
**C 59**—A. R. Mosler & Co., Mount Vernon, N. Y.  
**C 90**—Randall-Falchney Co., Boston, Mass.  
**D 178a**—Silvex Co., New York, N. Y.  
**Specialties.**  
**D 55, 56, 57**—Cox Brass Mfg. Co., Albany, N. Y.  
**D 52, 53**—Donnelly Motor Equipment Co., New York, N. Y.  
**D 107**—Englisch & Mersick Co., New Haven, Conn.  
**D 81**—Garage Equipment Co., Milwaukee, Wis.  
**D 176a**—Hall-Thompson Co., Hartford, Conn.  
**D 50**—Stewart & Co., New York, N. Y.  
**Speedometers.**  
**D 202**—Corbin Screw Corp., New Britain, Conn.  
**C 61**—Hoffecker Co., Boston, Mass.  
**C 84**—Standard Thermometer Co., Boston, Mass.  
**C 29**—Stewart-Warner Speedometer Corp., Chicago, Ill.  
**Springs.**  
**D 178**—Detroit Steel Products Co., Detroit, Mich.  
**D 204**—Perfection Spring Co., Cleveland, O.  
**Stampings, Metal.**  
**D 74**—Metal Stamping Co., Long Island City, N. Y.  
**Steering Wheel Warmers.**  
**D 35a**—Warm Hand Steering Wheel Corp., Poughkeepsie, N. Y.  
**Storage Systems.**  
**D 141a**—American Pump & Tank Co., New York, N. Y.  
**C 47, 48**—S. F. Bowser & Co., Ft. Wayne, Ind.  
**D 1a**—Hydraulic Oil Storage Co., New York, N. Y.  
**C 113**—Janney, Steinmetz & Co., Philadelphia, Penn.  
**D 93, 94**—Wayne Oil Tank & Pump Co., Ft. Wayne, Ind.  
**Tires and Tubes.**  
**D 106**—Braender Rubber & Tire Co., Rutherford, N. J.  
**D 40**—Cataract Rubber Co., Boston, Mass.  
**D 45**—Columb Tyres Import Co., New York, N. Y.  
**D 78, 79**—Double Fabric Tire Co., Auburn, Ind.  
**D 11a**—Marathon Tire Sales Co., New York, N. Y.  
**D 1**—Miller Rubber Co., Akron, O.  
**D 23**—Overman Tire Co., New York, N. Y.  
**D 70, 71, 72**—Thermold Rubber Mfg. Co., Trenton, N. J.  
**D 102**—United & Globe Mfg. Co., Trenton, N. J.  
**D 80**—Voorhees Rubber Mfg. Co., Jersey City, N. J.  
**Tire Accessories.**  
**D 83**—J. L. G. Dykes Co., Chicago, Ill.  
**D 142**—Julian H. Faw, New York, N. Y.  
**D 141**—National Rubber Co., St. Louis, Mo.  
**D 216**—Stevens & Co., New York, N. Y.  
**D 100**—Chas. O. Tingley & Co., Rahway, N. J.  
**Tire Gauges.**  
**C 82, 83**—A. Schrader's Sons, New York, N. Y.  
**D 212**—U. S. Gauge Co., New York, N. Y.  
**Tire Protectors.**  
**C 62**—Leather Tire Goods Co., Niagara Falls, N. Y.  
**Tops and Top Materials.**  
**D 91, 92**—F. S. Carr Co., Boston, Mass.  
**C 72**—L. C. Chase & Co., Boston, Mass.  
**D 12a**—Cleveland Hardware Co., Cleveland, O.  
**D 181, 182**—Golde-Patent Mfg. Co., New York, N. Y.  
**D 22**—Wm. R. Laidlaw, Jr., New York, N. Y.  
**D 208**—L. J. Mutty Co., Boston, Mass.  
**C 32, 33**—Pantasote Co., New York, N. Y.  
**D 27a**—P. Reilly & Son, Newark, N. J.  
**D 177a**—Sharrer Patent Top Co., New York, N. Y.  
**Trunks.**  
**D 104**—Ajax Trunk & Sample Case Co., New York, N. Y.  
**D 138, 139**—Berg Trunk & Specialty Co., New York, N. Y.  
**Universal Joints.**  
**C 67**—Spicer Mfg. Co., Plainfield, N. J.  
**Vulcanizers.**  
**C 35**—C. A. Shaler Co., Waupun, Wis.  
**Wheels.**  
**C 27**—Hayes Mfg. Co., Detroit, Mich.  
**D 198**—Geo. Houck Co., Philadelphia, Penn.  
**D 211**—Ideal Steel Wheel Co., Cincinnati, O.  
**C 24**—Schwarz Wheel Co., Philadelphia, Penn.  
**Windshields.**  
**D 76**—H. W. Johns-Manville Co., New York, N. Y.  
**Worm Gears.**  
**D 15a, 16**—Cleveland Worm Gear Co., Cleveland, O.



C 43—Wm. Cramp & Sons, Sh. & Eng. Bldg. Co., Philadelphia, Penn.

**Wrenches.**

D 58—Asch & Co., New York, N. Y.

C 57—Coes Wrench Co., Worcester, Mass.

**Unclassified.**

D 59a—Eveland Eng. & Mfg. Co., Philadelphia, Penn.

D 8a—Gem Supply Co., Waterbury, Conn.

D 44—Hans Motor Equipment Co., La Crosse, Wis.

D 118—Motor Patents Co., Detroit, Mich.

D 41—National Metal Moulding Co., Pittsburg, Penn.

D 16a—Paul G. Niehoff & Co., Chicago, Ill.

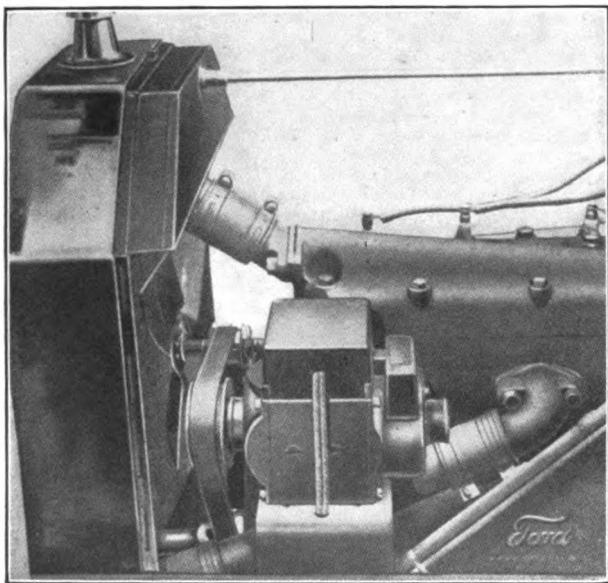
D 32—Swyers & Lorch, Pittsburg, Penn.

D 76—Trenton Brass & Machine Co., New York, N. Y.

## DYNETO LIGHTING SYSTEM FOR FORD.

**T**HE Dyneto Electric Company, maker of lighting systems for motor cars, is manufacturing a lighting equipment for the model T Ford automobile, which is a complete outfit, including as it does the generator, storage battery, battery box, reflectors, bulbs, tail light, wiring, terminals, etc. The maker states that the system is not only moderately priced, but is installed easily, as complete instructions are supplied.

The dynamo is located on the left hand side of the motor, as will be noted by the accompanying illustration. A bracket is supplied for



Showing Installation of Dyneto Generator on Ford Car and Method of Drive.

supporting the generator, also for retaining it, and is placed with the belt pulley forward. Every part is made to fit and it is stated that the dynamo may be installed in an hour. Drive is by a one-inch endless belt, which replaces the usual fan belt, and the tension is regulated by the Ford fan belt adjustment.

The Dyneto generator weighs about 23 pounds, and combines in one apparatus a slow speed direct current generator and automatic switch, also automatic means for controlling the output to meet requirements. The automatic switch connects the generator with the storage

battery when the output of the former is sufficient to charge the cells, and disconnects the dynamo when the speed is too low for charging. The dynamo is cut in at a car speed of about 12 miles an hour and at higher ratios the output is automatically controlled. Below car speeds of 12 miles an hour and when the engine is inoperative, the battery supplies current for lighting.

A dash indicator is provided, which shows at all times whether the cells are being charged or discharged, and the switch is a Briggs & Stratton, providing the usual combinations and a dimming attachment. The switch button is in the form of a plug which can be removed to prevent tampering with the system.

A six-volt LBA battery is utilized, this being carried in a pressed steel box on the running board and it is stated that its capacity is such as to supply current for 10 hours of lighting with the motor inoperative. The wiring is very complete and is supplied to make connections without cutting or alterations. The ends of the leads are fitted with terminals for attachment to the posts for which they are designed. Two reflectors with bulbs are supplied, also a complete tail light, showing a white light over the number plate and a red to the rear. The company will supply a pair of nine-inch headlights, black enamelled, and fitted with either 16 or 20 candlepower bulbs at an additional cost. The complete Dyneto lighting system for Ford cars weighs about 75 pounds when packed for shipment.

Georges Boillot and Jules Goux, the former winner of this year's Grand Prix in France, and the latter the victor in the Indianapolis 500-mile race, are soon to visit this country, according to information received recently in American racing circles. It is understood that both men will make entry for next year's international sweepstakes on the Indianapolis speedway.

Several factories at Southington, Conn., engaged in the manufacture of motor car parts, fittings and accessories, are working overtime to fill orders. Business is reported to be unusually good for this season of the year. One forging concern is running three nights a week.



## HARROUN KEROSENE CARBURETOR.

**D**ETAILS of the kerosene carburetor invented by Ray Harroun, the former racing driver, have been made public by the Harroun Company of Indianapolis, Ind., which concern consolidated recently with the Electric Renovator Manufacturing Company of Pittsburg. Eventually the carburetor will be produced in a new plant which is being erected in Pittsburg.

The construction and operation of the Harroun carburetor is shown in an accompanying illustration, and it will be noted that part of the exhaust is forced through the space around the venturi, which heats the corrugated surface to a cherry red. This venturi passage is in the form of a spiral, and as the dense atomized fuel is drawn through by the suction of the piston of the motor the heavier particles are thrown to the outside against the heated surface by the centrifugal force, and the more volatile portion of the fuel remains in the centre.

The fuel, as it is sprayed from the nozzle and comes in contact with the hot surface, is turned into a vapor. This vapor is partially mixed with air which comes through the bottom of the venturi and is further diluted with cold air which comes through the secondary air valve.

The fuel opening in the nozzle is automatically opened and closed by the action of the secondary air valve. There is but one adjustment, that operated from the driver's seat through a suitable connection to the lever A on the side of the carburetor. This raises or lowers the fulcrum of the rocker arm G, which is inside of the carburetor, and raises and lowers the needle B as it is actuated by the air valve E.

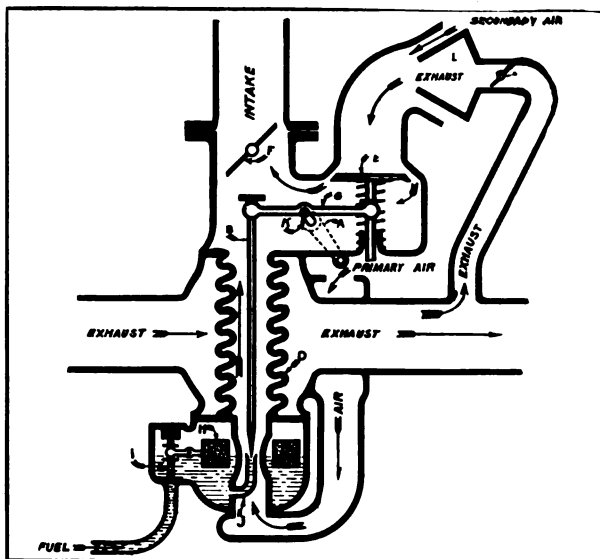
One of the features of the carburetor is that of taking a small portion of the exhaust gas back into the charge through the air valve opening. It is maintained by the designer that a part of the exhaust gas mixed with the charge eliminates the disagreeable pound which is always more noticeable with kerosene than gasoline. Water has been used a great deal to accomplish this result, but it is stated that it involves complications; is hard to regulate, and is not suitable for cold weather. The designer states that this gas mixing feature is an advantage even with gasoline, as it will positively eliminate a carbon knock and has other advantages which are held to be as follows:

There is supplied with the carburetor a means of regulating the amount of exhaust utilized, by the butterfly valve C. This may be operated from the dash and provides regulation of the maximum expansion period in relation to the piston travel under varying running con-

ditions. For example, it is known that the fuel consumption a horsepower-hour ranges from one-half to three-quarters of a pound at about 1000 feet a minute piston speed and increases very rapidly, both as the piston speed increases or decreases from this point, consuming sometimes as much as 1.5 pounds at about 500 and 1600 feet a minute piston speed.

This is an undesirable condition and is due to the fact that the speed at which a correct mixture will burn happens to be just right, at 1000 feet piston speed, to give its maximum pressure at the moment the crank arm and connecting rod are at right angles to each other, and the leverage the greatest. Therefore, any agency that will retard this burning speed without retarding the spark timing at slow motor speeds will increase the thermo efficiency. Under actual running conditions an automobile motor is rarely pushed to its maximum or even a normal load.

Atmospheric conditions, such as altitude and temperature, also affect this burning speed of the charge and it seems reasonable that there should be some means of control of this condition, and this method seems to solve this problem in a very satisfactory manner. The mileage on a gallon of fuel is very much increased and



**Sectional View of Harroun Kerosene Carburetor, Which Utilizes Heat of Exhaust for Increasing Temperature and Vaporizing the Fuel.**

strange to say the more of this exhaust element that is taken back into the motor the cooler it will run.

The Harroun carburetor is designed to operate on either kerosene or gasoline and without any change of adjustment. It is claimed that the mileage obtained is 10 per cent. greater when using kerosene and that tests have shown it will haul one ton one mile for one-third of a cent. The carburetor is now being marketed by the Harroun Company.

At the annual meeting of the Stevens-Duryea Company, Chicopee Falls, Mass., the following officers were elected: President, W. H. Whiteside; vice president, J. Frank Duryea; clerk, W. M. Remington. I. H. Page retired as treasurer.



## WORLD'S MARKET FOR AMERICAN CARS.

### Conditions Which Must Be Met in Order to Secure Export Business—How Last Year's Shipments Were Distributed—Possibilities in the Several Countries.

**F**EW motorists appreciate the magnitude of the automobile industry, either at home or abroad. It is barely 17 years since the first gasoline propelled road vehicle was imported into America. Last year the manufacturers of cars in the United States shipped automobiles to other countries to the value of \$25,000,000. Basing the estimate on the ratio of increase evidenced in the figures thus far available the valuation of cars exported will reach a total of approximately \$28,000,000 for year ending Dec. 31, 1913.

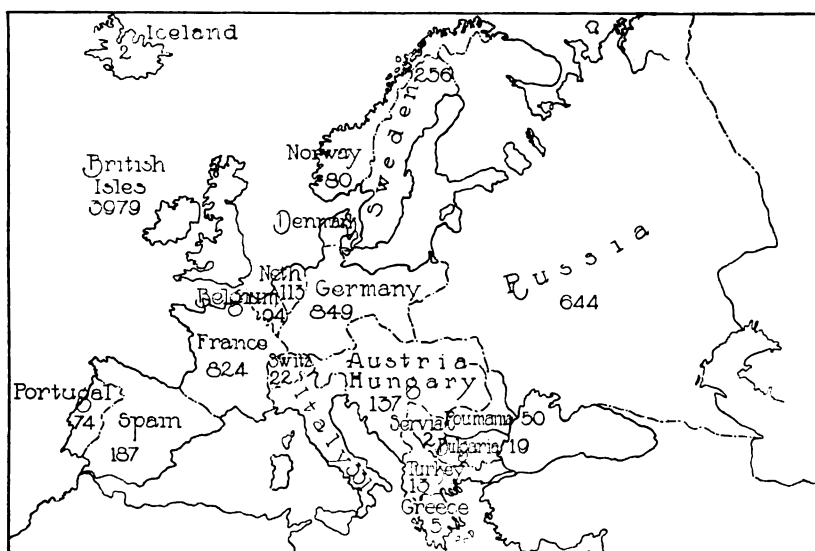
**Government's Figures for Last Fiscal Year.** It will be understood that the above statements apply to the calendar year, while an interesting tabulation presented herewith indicates the

consideration of the subject that the table becomes very largely a record of actual accomplishment. It is the purpose of this discussion to present some of these conditions as viewed by American exporters who are in constant touch with the situation in the various fields.

#### Monthly Comparison of Exports and Imports.

The Department of Commerce, Washington, D. C., issues a monthly summary of commerce and finance, which gives in addition to other information, a comparative compilation of exports and imports for each succeeding month and for that portion of the current calendar year which has already expired. This compilation is entirely separate and distinct from the statement issued after the close of the fiscal year. The last monthly summary available presents statistics for first nine months of 1913, in comparison with the same period in 1911 and 1912. These figures are reprinted herein.

From these it is learned that the exports of automobiles have increased a trifle over 84 per cent. in two years, while the imports have decreased approximately 38 per cent. during the same period. The average value of the cars exported in 1911 was \$1029, in 1912 \$992 and in 1913 \$1017. That for the machines imported in 1911 was \$2136, in 1912 \$2278, and in 1913 \$2342. It is much too early to determine whether or not



Map of Europe, Showing Number of Cars Shipped to Each Country.

number and value of both commercial and pleasure vehicles shipped to individual countries for the governmental fiscal year, ending June 30, 1913. It will be noted that the total for that period—\$26,012,934—exceeds that for the calendar year of 1912, but this apparent discrepancy is easily explained when it is remembered that the fiscal year comprises the last half of 1912 and the first half of 1913.

This tabulation is of particular interest, in that it is of valuable assistance in judging the possibilities of the foreign market. However, there are so many conditions entering into the

the change in tariff rates, admitting chassis at 30 per cent. duty instead of 45, will have any appreciable effect upon the import figures.

#### How Export Business Must Be Transacted.

The exportation of \$25,000,000 or \$28,000,000 worth of cars is not brought about without careful attention to details. Some manufacturers maintain direct factory branches in certain foreign countries from which the cars are re-shipped to their destination. Others have formed separate exporting companies in this country. A few do business direct, while a majority look to



the export houses on the Atlantic and Pacific Coasts for assistance in this respect.

Where an attempt is made to do business direct with the dealer in a foreign country, it usually becomes a question of receiving the cash before the goods are shipped. This has its disadvantages, because the dealer may have difficulty in securing the ready money, either to establish a drawing account in America or to pay for each car when ordered. As a result the sale of machines is retarded.

When the manufacturer is able to be represented abroad by a direct factory branch or through a subsidiary export company, the matter of extending credit to the dealer is assumed by these. This does not materially change the conditions, however, except insofar as the foreign representative has more ready access to the sources of information concerning the applicant for credit. When the dealer is located at a substantial distance from the branch or exporting company, the same general rule applies as when he seeks to do business with the factory direct.

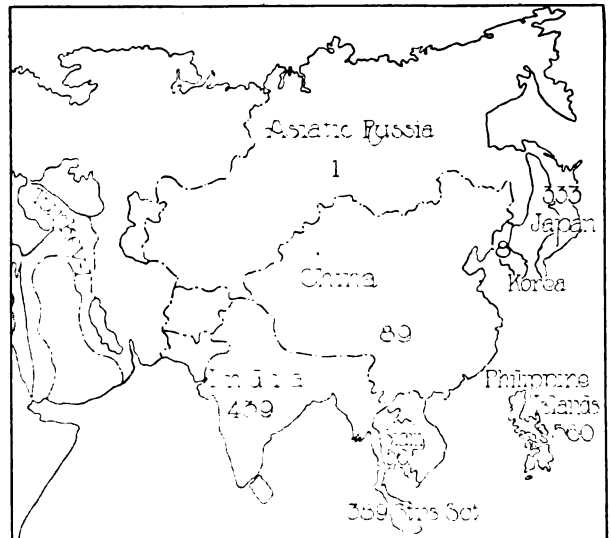
In doing business with an outside export house, the factory deals with that house alone. It is free to extend credit or demand cash, as the case may be, and it is stated that the same rule, of cash before delivery, usually applies in this instance. The export house has the advantage of dealing in a wide variety of articles—practically everything that is produced in America—and is in a position, through its confidential agents in the several commercial centres, to make its own terms with the local dealer. It follows that the general rule is to pay cash for the car upon delivery in New York, Philadelphia, Seattle, San Francisco or other port, and either extend credit or demand cash from the dealer as the circumstances appear to warrant from the knowledge of the situation supplied by its representatives.

**Necessary Expenses of** Only one condition  
**Exportation Methods.** has been considered in the above. Obviously the exportation of one or a number of cars is not without expense to the manufacturer. When business is done through an export house the car is sold by the manufacturer at the regular dealer's price, at which price, plus the freight, and the duty if any, it is resold to the dealer in the foreign country. The export house secures its remuneration from a commission on the sale, paid by the manufacturer.

It may readily be understood that the expense of maintaining a factory branch in a foreign country is considerable, although it may be conceded, at least for the sake of argument, that

some of this might be passed along to the dealer. The subsidiary export company also has its expenses, and much the same may be said concerning these. In dealing direct, the cost of securing business is governed very largely by the manufacturer himself, and may be much or little as the possibilities seem to indicate is desirable.

**Actual Conditions of the Market at Present.** For the purpose of securing reliable information concerning the world's markets for automobiles, the writer recently interviewed a number of men who are in close touch with the actual conditions in various world centres. These included representatives of export houses, who either have just returned from the country in question or were in receipt of recent reports from their confidential agents in the field. Some of them have been exporting



How Cars Were Distributed in Asia.

automobiles since 1902, and are still making periodical business trips into sections of the globe concerning which few Americans are at all familiar, even as tourists. There can be little doubt that the resume which follows presents actual conditions as they exist in the several countries.

**The Situation in the Dominion of Canada.** It will be noted, from the accompanying tables, that America's best customer for motor vehicles is its nearest neighbor on the North. Canada took over \$8,000,000 worth of the \$26,000,000 exported during the last fiscal year, or nearly one-third of the whole. There has been a slight falling off both in the number and valuation of cars shipped to Canada this year, as compared with the same period in 1912. Many American motor car manufacturers maintain branch factories in that



country, and the competition with British and other foreign made machines is somewhat more keen than in the States. Two conditions have developed within the past year, which under ordinary circumstances should make for better business. One is the enactment of a measure permitting the use of automobiles three days a week in the province of Prince Edward Island, where the operation of cars had been prohibited since 1908. The other is the repeal of the former stringent regulations in the province of Nova Scotia. Much highway improvement work has been under way in the western part of the Dominion, and this ought also to have its influence



Indicating the Market in South America.

upon the sale and use of machines in that section, especially during the next few years.

**Improved Roads Work in United Kingdom.** The United Kingdom took \$3,000,000 worth of cars during the fiscal year, and it would appear that the market was still good, since during the first nine months of 1913 over \$2,900,000 worth of machines were exported to England, Scotland and Ireland. Considerable road work has been done in various sections of Great Britain, and this is also true of Ireland. It does not appear that American cars have been sold in any large number in Ireland, as yet, however.

**Conditions Applying in France and Germany.** Continental Europe contributed \$3,300,000 of the total, and it is possible that a portion of this figure rightfully belongs under other heads, as many machines were exported to France, for example, which were later re-exported to other countries—probably to dealers in Asia and Africa. It is explained that it is difficult to secure representation in France, except on a credit basis, and for this reason those familiar with conditions in that country urge that American manufacturers establish agencies or branches, well supplied with spare parts, etc.

In Germany, which is listed for \$728,000 as against France's \$625,000, the demand for American cars appears to be increasing, despite reports of a very determined opposition on the part of German manufacturers. The number of cars in use in various sections of that country has increased very materially during past two years.

**Situation Offers Good Opportunity in Russia.** American cars are well represented in Russia, which invested \$520,000, according to the table. The government has given valuable assistance by contracting for motor trucks and pleasure cars made in the United States. The makes registered during the past year included: American, 17; French, 15; German, 13; British, 10; Italian, two, and Austrian, one. There appears to be little probability that there will be any decided competition from Russian made machines, at least for the present, since business men receive little financial encouragement to form companies of this character. Continental manufacturers are said to be making sales on a basis that is not regarded as entirely safe by Americans, and some European concerns are establishing branch factories in that country. Almost every large city and town has its automobile agent, but the chief difficulty lies in the inability to secure spare parts quickly. The road conditions are far from ideal in many sections, particularly in the interior.

**Dealers Have Criticism in Italy and Austria.** There is a consistent demand for good, medium priced American cars in Italy, but some criticism is offered because of their appearance. Dealers maintain that they easily could secure more money if more attention were given to the finish. Criticism is also made against the practise of American manufacturers in fitting tires using the inch measurement, and speedometers calibrated for miles instead of kilometers. It is suggested that the best method to pursue with dealers is to establish a general agency, say in Paris, from which



point spare parts might readily be secured.

The terms offered by the American manufacturer do not appeal to Austrian dealers, and it is explained that very few of them will give consideration to a proposition for payment in advance. In fact, the general impression seems to be that the manufacturer should make a first hand endeavor to get an opening where he can show what he has for sale rather than expect buyers to come to him. This is a condition which cannot easily be overcome at present.

#### Prejudice Contributes

#### Difficulties in Spain.

A few low priced, one-cylinder American machines sold some years ago in Spain are still remembered in that country, and there is a certain prejudice against being known as the owner of a "cheap" car. However, the demand for American automobiles has increased somewhat during the past two years. Some criticism is offered because of inability to secure spare parts, even when a general agency is located on the Continent. Local agents are quite prone to seek a large profit on their investment, often increasing the selling price to double what it is in the United States. Extreme care is necessary in the selection of a representative. The Spanish government lends every encouragement to home industry wherever possible.

#### Conditions Seem Good

#### for Danish Business.

About one-third of the 7000 or 8000 automobiles in Denmark are of American manufacture. There is very little sale for a high powered car. Machines ranging between 12 and 18 horsepower have been found most suitable for Danish roads, and the saving in gasoline and tires is a matter that has considerable weight with the people. Many physicians and professional men are using three-wheeled machines, made in Germany, largely because of the peculiar requirements of the motorizing regulations, which are not so severe for vehicles of this type. Cyclecars also are meeting with success in Denmark for this same reason.

#### Portugal Must Meet

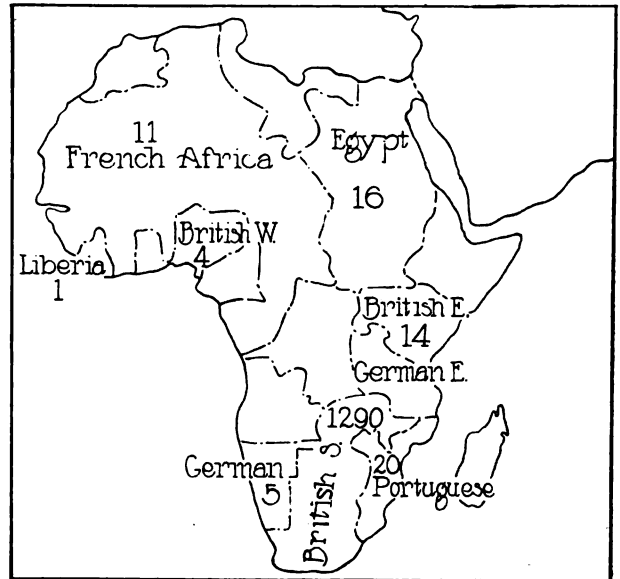
#### Heavy Freight Charge.

Cars must be strongly built and well able to climb hills in order to meet with success in Portugal. Many fine stretches of macadam road have been built, but these are often interspersed with badly rutted ways. The heavy freight charges from New York are a serious handicap for the American manufacturer, in view of the nearness of the Continental factories. American machines are regarded with favor, but the manufacturer must expect to be governed by the trade requirements of the country, and dealers will demand credit.

#### Other European Countries Problematical.

Norwegians prefer the low priced American cars, but when high priced machines are considered, they patronize French, German and English concerns. The same thing applies in a large measure to Sweden. In Switzerland there is some complaint on the part of the dealers because the selling price is fixed in advance by the manufacturer and because the commissions are not as large as with some Continental makes.

The Balkan war had an appreciable effect upon the sale of automobiles in the smaller European states, but it also served to call direct attention to the merits of motor vehicles for various purposes. The market for cars and trucks



American Cars Exported to African States.

undoubtedly will see a number of changes in that section during the next few years.

#### Conditions Which Apply to South America.

The importance of South America as a market for automobiles is only partially understood by residents of the United States. It undoubtedly is true that European manufacturers have sold more cars in this territory than Americans, but the figures for the fiscal year show that machines valued at more than \$3,000,000 were shipped to the South American republics.

Opinions regarding the people of South America have undergone a decided change during the past few years. This applies more particularly to the automobile industry, but it also has its application to every line. The country is rich in natural resources, and many large cities have



grown up along the coast. The people are accustomed to buying the best.

Contrary to the accepted view in the United States, the Latin Americans have no political feeling against this republic—at least, any such feeling that they may have is not such as to interfere with commercial intercourse. There is a belief among them that, whenever they desire to purchase the best, they must go to Europe for it, not because high grade products are not manufactured in this country, but because South America never sees them. They maintain that when they order such goods from America they invariably receive poor treatment.

### Why Development Has Been Retarded.

Numerous examples are cited to bear out the assertion that the United States considers South America a suitable dumping ground for goods that are entirely unsalable in this country. The development of the automobile market in Brazil, Argentine, Chile, etc., undoubtedly was delayed much longer than necessary by the fact that certain concerns failed to realize the importance of the initial orders.

One case will prove sufficient to illustrate the point. A well-to-do Brazilian was visiting in New York City and had opportunity to judge of the merits of a high grade American car. Before returning home he placed an order for one of these machines, paying some \$8500 in cash. When the car arrived in Brazil it was found to be minus certain parts essential to its use. A cablegram resulted in the shipment of parts for another and an older model, which could not be applied to the car in question. The purchaser never was able to use his machine, and over \$8500 was expended for nothing.

It might be contended that this was an isolated case, but exporters assert that they are continually hearing similar stories, making it exceedingly difficult to interest parties in certain localities. Of course, many good American cars have been shipped to South America during the past two years, and these are giving excellent satisfaction. It is noticeable, however, that when a high priced machine is desired, the choice usually falls to a car of European make.

### Argentina Undergoing Financial Depression.

Argentina purchased \$1,250,000 worth of American automobiles during the fiscal year. Much road work has been done in this republic and conditions in this respect are improving very rapidly. Just at present the country is undergoing a financial depression, and it is stated that several

hundred thousand dollars worth of cars are being held in storerooms and warehouses, there being no demand for them at present. This is, of course, a temporary condition, which undoubtedly will be overcome in due time.

**Market Conditions in Brazil and Uruguay.** In Brazil, which took cars valued at \$1,100,000, road conditions are by no means as good, outside some of the larger cities. The market seems to be good for low and medium priced machines, but it is extremely difficult to interest the people in American high priced cars. The same conditions apply in a large measure to Uruguay, which contributed \$290,000 to South America's total.

Much road work is under way in other South American republics, particularly in Venezuela, which has proved to be a very good market for American machines. The demand for automobiles of any character is still limited in some of these countries, but the work now being done by American manufacturers, their representatives and the exporting houses is believed to be such that when it is possible to do business on a larger scale the United States will get its share.

### EXPORTATION OF AMERICAN AUTOMOBILES FOR FISCAL YEAR ENDING JUNE 30, 1913.

|                         |     | —Commercial— |       | —Passenger— |       |
|-------------------------|-----|--------------|-------|-------------|-------|
|                         |     | Number       | Value | Number      | Value |
| Austria-Hungary         | 2   | 3,959        | 135   | 991,781     |       |
| Azores                  |     |              | 16    | 10,549      |       |
| Belgium                 |     |              | 94    | 85,679      |       |
| Bulgaria                | 2   | 1,528        | 17    | 11,457      |       |
| Denmark                 | 3   | 2,120        | 81    | 77,149      |       |
| Finland                 |     |              | 51    | 53,568      |       |
| France                  | 6   | 10,709       | 818   | 615,086     |       |
| Germany                 | 4   | 4,029        | 845   | 764,389     |       |
| Gibraltar               |     |              | 7     | 6,576       |       |
| Greece                  | 1   | 1,176        | 4     | 4,080       |       |
| Iceland                 |     |              | 2     | 1,016       |       |
| Italy                   |     |              | 331   | 280,961     |       |
| Netherlands             | 2   | 4,489        | 111   | 94,163      |       |
| Norway                  | 2   | 2,200        | 78    | 66,689      |       |
| Portugal                | 1   | 1,400        | 73    | 58,931      |       |
| Roumania                | 12  | 12,000       | 38    | 30,337      |       |
| Russia in Europe        | 13  | 34,163       | 580   | 484,913     |       |
| Servia                  |     |              | 2     | 1,160       |       |
| Spain                   | 1   | 1,400        | 186   | 127,621     |       |
| Sweden                  |     |              | 256   | 235,918     |       |
| Switzerland             |     |              | 22    | 24,965      |       |
| Turkey in Europe        |     |              | 13    | 9,814       |       |
| England                 | 184 | 119,468      | 3,783 | 2,893,785   |       |
| Scotland                |     |              | 6     | 8,104       |       |
| Ireland                 |     |              | 6     | 5,538       |       |
| British Honduras        |     |              | 1     | 1,800       |       |
| Canada                  | 489 | 1,004,237    | 6,723 | 8,229,324   |       |
| Costa Rica              | 2   | 3,643        | 13    | 14,955      |       |
| Guatemala               |     |              | 10    | 14,892      |       |
| Honduras                | 1   | 3,000        | 4     | 8,100       |       |
| Panama                  |     |              | 39    | 43,432      |       |
| Salvador                |     |              | 11    | 13,212      |       |
| Mexico                  | 35  | 83,363       | 235   | 423,123     |       |
| Newfoundland            | 4   | 8,845        | 9     | 10,353      |       |
| Barbados                |     |              | 7     | 5,973       |       |
| Jamaica                 | 4   | 9,234        | 62    | 59,131      |       |
| Trinidad                |     |              | 43    | 39,902      |       |
| Other British W. Indies |     |              | 7     | 6,716       |       |
| Cuba                    | 14  | 23,639       | 223   | 242,686     |       |
| Danish West Indies      | 1   | 4,250        | 4     | 2,131       |       |
| Dutch West Indies       |     |              | 19    | 14,590      |       |



## EXPORT TABULATION CONTINUED.

|                            | —Commercial— |             | —Passenger— |              |
|----------------------------|--------------|-------------|-------------|--------------|
|                            | Number       | Value       | Number      | Value        |
| French West Indies .. .    |              |             | 5           | 3,877        |
| Haiti .....                | 3            | 5,553       | 38          | 24,499       |
| Santo Domingo .....        | 1            | 1,858       | 7           | 5,382        |
| Argentina .....            | 35           | 78,000      | 1,062       | 1,181,735    |
| Bolivia .....              |              |             | 2           | 1,493        |
| Brazil .....               | 36           | 75,073      | 987         | 1,035,247    |
| Chile .....                |              |             | 78          | 109,982      |
| Colombia .....             | 3            | 6,112       | 110         | 113,334      |
| Ecuador .....              | 1            | 2,017       | 74          | 55,372       |
| British Guiana .....       |              |             | 18          | 14,313       |
| French Guiana .....        |              |             | 1           | 558          |
| Peru .....                 |              |             | 70          | 55,646       |
| Uruguay .....              | 7            | 19,280      | 209         | 273,253      |
| Venezuela .....            | 23           | 34,291      | 104         | 109,499      |
| Aden .....                 |              |             | 15          | 7,998        |
| China .....                |              |             | 89          | 90,456       |
| Chosen (Korea) .....       | 1            | 3,500       | 7           | 6,095        |
| British India .....        |              |             | 439         | 355,573      |
| Straits Settlements .. 2   |              | 5,588       | 387         | 319,247      |
| Other British E. Indies .. |              |             | 39          | 31,245       |
| Dutch East Indies.... 2    |              | 4,840       | 278         | 198,378      |
| Hongkong .....             |              |             | 7           | 6,673        |
| Japan .....                | 21           | 32,770      | 312         | 364,507      |
| Russia, Asiatic .....      |              |             | 1           | 1,160        |
| Siam .....                 |              |             | 56          | 35,934       |
| Turkey in Asia .....       |              |             | 1           | 824          |
| Australia and Tasmania 17  |              | 23,027      | 2,083       | 1,896,990    |
| New Zealand .....          | 1            | 1,201       | 958         | 990,837      |
| Other British Oceania ..   |              |             | 3           | 2,396        |
| French Oceania .....       | 2            | 3,400       | 11          | 14,005       |
| German Oceania .....       |              |             | 1           | 350          |
| Philippine Islands .....   | 43           | 91,809      | 517         | 577,040      |
| British West Africa....    |              |             | 4           | 2,688        |
| British South Africa... 11 |              | 9,476       | 1,279       | 1,157,895    |
| British East Africa....    |              |             | 14          | 12,802       |
| Canary Islands .....       |              |             | 10          | 6,426        |
| French Africa .....        | 1            | 858         | 10          | 7,297        |
| German Africa .....        |              |             | 5           | 3,175        |
| Liberia .....              |              |             | 1           | 805          |
| Portuguese Africa .....    |              |             | 20          | 16,102       |
| Egypt .....                |              |             | 16          | 10,156       |
| Total .....                | 993          | \$1,737,141 | 24,293      | \$24,275,793 |

### Situation in Asia and the Oriental Lands.

Asia purchased cars valued at \$1,425,000. It will be understood that of the millions of people in Asia, only a comparatively small percentage can be considered as possible purchasers of automobiles. It is true here, as in South America, that the wealthier class usually considers only the European product when in the market for high grade machines. The reason is somewhat different, however. For several years the only American machines seen in many of these countries were those having one and two-cylinder engines, and while these gave good service they helped to convey the impression that all American cars were of this type. In the meantime, British and European interests, with whom many of the governing classes were more closely identified, were engaged in developing the market.

In Asia proper, British India was the best market for American machines during the fiscal year. This was due largely to the fact that several cars of American make rendered good service during the Durbar at Delhi, and many of the

Indian officials and business men became interested as a result. Road conditions are improving slowly. The market is limited to some extent by the percentage of people who may be regarded as well-to-do and therefore able to own cars.

**Straits Settlements and Siam Business.** The Straits Settlements also purchased a large number of American cars. It has been suggested repeatedly in British motoring prints that there was an excellent market for motor trucks in this district. It undoubtedly is true that motor trucks would be of invaluable service to the planters, but the present price of rubber probably will have the effect of postponing action until the financial situation improves.

Many of the so-called native houses in Siam are owned by Chinese, several of whom may be regarded as very wealthy. Some of these might be interested in motor trucks, but it would be necessary to work the territory systematically and render a service, with respect to spare parts, etc., that would permit of no delay. The road conditions are such that the small cars are considered by few the best sellers.

**Road Conditions Bad in Japan and China.** In Japan, financial conditions are such at present as to make it a little more difficult to interest the people in automobiles. The government is not in a prosperous condition, and this has a decided effect upon business generally, as financial operations depend somewhat largely upon the government's expenditures for internal improvements, etc. The roads are narrow, and must be rebuilt for automobile use in some instances.

China is looked upon as a favorable market, but business conditions cannot be regarded as settled just now. It is probably true that such Chinese as are able to afford automobiles will be more kindly disposed toward them under the new regime. The scarcity of roads of any description worthy the name will influence the sale of machines in many sections, however.

**Africa and Australia Offer a Good Market.** Africa is rightfully considered a new country. Americans are not free to compete here on equal terms with all other countries. The Continent took \$1,217,000 worth of American machines during the fiscal year, and in many instances American manufacturers have been able to place orders in advance of any other maker. This is particularly true of British South Africa, which contributed \$1,167,000. Road conditions are improving rapidly, and the market undoubtedly will keep pace.



Australia, Tasmania and New Zealand purchased nearly \$3,000,000 worth of American machines, and the people are very favorably disposed toward them. The road conditions are ideal. These islands are so far from the country of origin in any event that Americans are not handicapped in this respect. It is possible to secure reliable agents in both Australia and Africa.

The other islands of the Pacific offer their own particular problems. The Philippines are regarded as an export field, although under United States supervision. The market for American machines is growing very rapidly.

**Question of Selecting Route for Shipment.** Exporters to the Philippines and Asia are compelled to consider the advisability of shipping by way of the Atlantic or Pacific ports. Time is saved by the

there is said to be a growing demand for a light weight machine of limited horsepower for town use. The importers in New York City are divided in their opinion with respect to this point, however.

E. Lascaris, who is regarded by importers and dealers in American cars in New York City, as best informed respecting the market for foreign machines, states as his opinion that the demand for small cars among those desiring the imported product is not large, and that the big car is the real seller. He adds that he does not believe the reduction in tariff will have any appreciable effect on this branch of the industry.

### OPENS CINCINNATI BRANCH.

The Auto Parts Company, Providence, R. I., maker of the well known Apco Ford specialties, announces that it has opened a distributing branch at 806 Race street, Cincinnati, O. This is the heart of the automobile district in that city, and the branch will be in charge of John Wilson, Jr., a vice president of the concern.

The Apco line is one of the most comprehensive manufactured in this country, embracing practically every accessory that makes for the comfort of Ford owners, and the wide distribution of Ford cars throughout the country has impelled the company to adopt this method of

serving the public. Branches also have been established in Boston, Philadelphia, Chicago, Los Angeles and San Francisco. The officers of the Auto Parts Company are: President and treasurer, Thomas F. Wilson; vice president, John Wilson, Jr., and secretary, William M. Wilson.

The Thompson-Carroll Company, Leader-News building, Cleveland, O., is mailing to the trade a neat brochure calling attention to its establishment of an advertising agency in that city. The members of the organization include Clyde S. Thompson, George A. Schneider, Charles F. Carroll, L. Z. Stone and Fred S. Tuerk. Mr. Thompson is well known to the industry, and was for two years advertising manager of the Diamond Rubber Company.

#### COMPARATIVE COMPILATION FOR FIRST NINE MONTHS OF THE YEAR.

| Exports—                     |        | 1911         |        | 1912         |        | 1913         |  |
|------------------------------|--------|--------------|--------|--------------|--------|--------------|--|
| Country                      | No.    | Value        | No.    | Value        | No.    | Value        |  |
| France .....                 | 352    | \$393,448    | 543    | \$414,493    | 655    | \$510,331    |  |
| Germany .....                | 90     | 106,382      | 347    | 270,769      | 858    | 747,543      |  |
| Italy .....                  | 161    | 188,557      | 241    | 214,651      | 259    | 222,008      |  |
| United Kingdom .....         | 2,563  | 2,170,264    | 3,942  | 2,944,118    | 3,900  | 2,934,237    |  |
| Other Europe .....           | 633    | 601,486      | 1,278  | 1,044,658    | 1,483  | 1,263,828    |  |
| Canada .....                 | 4,107  | 4,493,287    | 5,988  | 7,213,639    | 5,260  | 7,050,317    |  |
| Mexico .....                 | 187    | 311,427      | 181    | 289,873      | 175    | 321,379      |  |
| W. Indies and Bermuda .....  | 213    | 249,799      | 238    | 250,698      | 370    | 361,428      |  |
| South America .....          | 664    | 867,292      | 1,395  | 1,615,378    | 2,089  | 2,372,980    |  |
| British Oceania .....        | 1,467  | 1,353,398    | 2,585  | 2,355,520    | 2,418  | 2,275,226    |  |
| Asia and other Oceania ..... | 603    | 611,805      | 1,135  | 1,143,251    | 1,770  | 1,748,083    |  |
| Other countries .....        | 204    | 217,889      | 533    | 495,251      | 1,716  | 1,494,498    |  |
| Total.....                   | 11,244 | \$11,565,034 | 18,406 | \$18,252,299 | 20,953 | \$21,301,858 |  |
| Imports—                     |        | 1911         |        | 1912         |        | 1913         |  |
| Country                      | No.    | Value        | No.    | Value        | No.    | Value        |  |
| France.....                  | 227    | \$499,769    | 333    | \$808,885    | 143    | \$331,311    |  |
| Germany .....                | 113    | 245,647      | 44     | 104,869      | 77     | 202,931      |  |
| Italy .....                  | 85     | 135,739      | 73     | 116,227      | 68     | 125,918      |  |
| United Kingdom .....         | 105    | 251,477      | 107    | 254,265      | 37     | 112,302      |  |
| Other countries .....        | 140    | 317,590      | 59     | 119,428      | 63     | 136,337      |  |
| Total.....                   | 670    | \$1,450,222  | 616    | \$1,403,174  | 388    | \$908,799    |  |

latter route, but the expense is greater. This is due to the overland freight charges. Shipments from New York, for instance, to Manila by way of the Suez canal occupy from 55 to 60 days, while they will go by way of the Pacific in 40 to 45. It is probable that the opening of the Panama canal will have a decided effect with respect to all shipments going to the Orient.

#### The American Market for Foreign Machines.

By far the largest proportion of machines imported into this country are handled by importers in New York City. The market is decidedly limited, both because of the price and because Americans believe that it is possible to secure as good a grade of car in this country as abroad. Among those who prefer a foreign article, no matter what the price,



## NEW AND NOVEL ACCESSORIES THAT APPEAL TO MOTORISTS

**Boston Tail Light Detector.**

The Harding Specialties Company, Inc., 755 Boylston street, Boston, is manufacturing the Boston tail light detector, a device that will be appreciated by automobilists who motor in cities where the ordinance governing the use of the rear signal is strictly enforced. The Boston is neat and compact; is mounted on the dash in plain view of the driver, and upon the tail light becoming extinguished, flashes a red light. One of its qualities is that it may be installed by the novice in five minutes. Provision is also made for connecting up the speedometer or dash lamp if desired. A quality of the detector is that series wiring is eliminated with the special three-volt lamps. Standard lamps are employed. The Boston is made of heavy brass and comes in black-nickel, brass, oxidized-black and nickel finishes. Special finishes are supplied at a slight extra cost.

**Sure Start Electric Vaporizer.**

The United Motor Equipment Company, Chicago, is marketing through its sales agent, W. E. & J. H. Dodson, the Sure Start electric vaporizer, which is a compact device weighing 10 ounces, and which increases the temperature of the fuel by the use of electricity. It is at-

porated in the fuel line and prevents the entrance of water and other foreign elements to the carburetor. One of the features of the filter is that petcocks are eliminated. The strainer is very compact and the maker states there are no joints to become loose and cause loss of fuel. The Mosler strainer is inexpensive and the best of material and workmanship are incorporated.

**F. S. & D. Foot Warmer.**

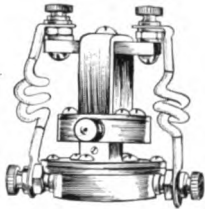
The F. S. & D. foot warmer is produced by the F. S. & D. Manufacturing Company, 15 Genesee street, Syracuse, N. Y., and the warmer proper is a neat, compact design, which may be located in both the driver's and rear compartments of the car. It is designed to replace the foot rail and is highly polished. The exhaust of the motor is utilized for heating and valves are incorporated for controlling or cutting out the supply as desired. The exhaust is led to the warmer through asbestos covered pipes, thence to the outer air.

**Dann Oil Cushion Spring Insert.**

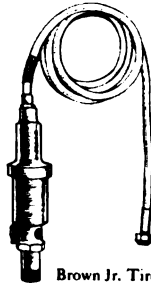
The Dann oil cushion spring inserts are manufactured by the Dann Oil Cushion Spring Insert Company, Chicago, and are made of a special soft, ductile metal, .015625 inch thick, rolled to standard spring widths, and perforated



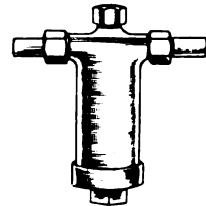
Boston Tail Light Detector



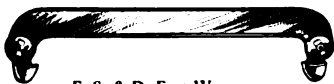
Sure Start Electric Vaporizer



Brown Jr. Tire Pump



Mosler Ball Check Strainer

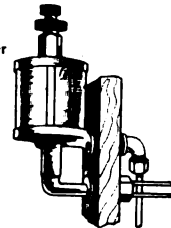


F. S. &amp; D. Foot Warmer



Dann Oil Cushion Spring Insert

Kellogg Engine Primer



tached in proximity to the intake manifold, this being tapped to connect a tube conveying the vapor, which is drawn into the cylinders in the usual manner. A small switch is mounted on the dash and controls both the supply of fuel and the electricity which is taken from a six-volt battery. The maker states it requires but a few seconds for the current to increase the temperature of the fuel to a point making for rapid evaporation.

**Brown Jr. Tire Pump.**

The Brown Company, Syracuse, N. Y., maker of Brown tire pump, has brought out a new design termed the Brown Jr., which is moderately priced and designed particularly for the owner of the small car. It is identical in all respects save the size and length of hose and is not equipped with a gauge. The pump operates on the compound principle, inflating the tire with pure, cool air, and it is stated that a shoe can be pumped up to a pressure of 60 pounds in three minutes, or to 150 if desired. The cylinders are of gray iron, bored and reamed on special machines, and the finish is two coats of gray enamel. The same high grade material and workmanship characteristic of the product of the concern is incorporated in the new design. For \$1.50 extra the company will supply its Q. D. spark plug and special attachments, including a pump connection.

**Mosler Ball Check Strainer.**

A. R. Mosler & Co., Mount Vernon, N. Y., maker of the well known Spitfire spark plugs, is marketing the Mosler ball check gasoline strainer, which is incor-

porated in the fuel line and prevents the entrance of water and other foreign elements to the carburetor. One of the features of the filter is that petcocks are eliminated. The strainer is very compact and the maker states there are no joints to become loose and cause loss of fuel. The Mosler strainer is inexpensive and the best of material and workmanship are incorporated.

**Kellogg Engine Primer.**

The Kellogg Manufacturing Company, Rochester, N. Y., is marketing a novel form of engine primer which differs from the conventional designs in that the dash vessel is of the self-filling type. The container is of glass and is provided with two knurled nuts or valves, the upper being utilized to fill the vessel while the other controls the flow of the priming fluid to the motor. The fuel supply is obtained by turning the top knurled member to the left, the gasoline being forced from the tank to the glass member by the vacuum created by the suction of the intake stroke of the piston of the motor. It will be noted that two small pipes are attached to the dash vessel, and these are run through each arm of the intake manifold, thence directly over the intake valves of the engine. Operating the lower knurled nut permits the fuel to flow over the valves and at the same time the fluid is mixed with the incoming air drawn in through the carburetor when the engine is cranked. This assures a rich mixture for starting and one of the qualities of the primer is that the flow may be so controlled as to provide a slightly rich mixture until the engine is warm enough to operate on the normal mixture. The company also manufactures a model for pressure feed fuel systems.





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**CONDITIONS IN NEW YORK.**

Being nearer Wall street, it may be assumed that the market served by the New York dealers is more easily influenced than others by any tendency toward business or financial depression. Investigation of the conditions confronting these dealers reveals a situation that is decidedly encouraging.

As set forth in greater detail elsewhere, there is a disposition among these men to feel that the present dullness is manufactured—that there is no real reason why business should not be good. They have found a decided upward movement during the past few weeks, and anticipate normal conditions after the show. The situation is particularly reassuring and should go far toward dispelling any suggestion that 1914 is not to be

a good year for the sale of cars, accessories and fittings.

An especially interesting feature is the very apparent recognition of the fact that the selling of automobiles has reached a point where it must be conducted on strictly business principles. New York dealers have done much toward reorganizing the sales force and system of doing business. There can be no doubt that these men are building for the future, and that strict adherence to this policy, supported as it will be by the manufacturers, must make for greater stability and success.

**HOME AND FOREIGN MARKETS.**

From time to time the question arises as to how many cars are in use in America. There are some 100,000,000 people in the United States, basing the estimate on the figures of the last census. A year ago, practically 1,000,000 cars were registered in the several states. The American industry has produced 450,000 machines during 1913. Assuming that, with the withdrawals of old cars, half of these must be added to the previous total, and there are today some 1,250,000.

Governmental figures indicate that there will have been something like 28,000 cars shipped abroad during 1913. At an average of \$1000 a car, this will make a total of \$28,000,000, as compared with a total of \$25,000,000 for 1912. The exportation of automobiles has increased 84 per cent. in two years. Undoubtedly it will be increased substantially in the future.

It would prove of interest to learn the number of people in the United States whose incomes are such that they could afford to own a car, but who have yet to purchase their first machine. A little thought concerning this phase of the situation will suggest that the percentage must be high.

Each manufacturer must decide for himself which market he shall exploit. Very few have as yet sought to inaugurate an energetic foreign campaign. There would appear to be plenty of opportunity for business at home, if the field were worked systematically and thoroughly. It becomes very largely a matter of expense, and this is a point that must be considered by every branch of the industry, from the manufacturer to the dealer.



## TOURING IN PREHISTORIC AMERICA.

**An Interesting Account of an Automobile Visit to a Section of the Country Rich in Relics of a Race Whose Existence Antedates Every Known Period.**

By James A. Harris, Jr.

**S**'TRANGEST of all Indian peoples, living practically the same as their tribal ancestors lived before the Mexican exploration, the Pueblos of northern New Mexico and the Navajos and Moquis of Arizona, with their wierd and wonderful communal houses built in a wilderness of ruins of a prehistoric civilization, furnish scenes of stirring, gripping interest to the tourist who explores this mystic region in a motor car.

Here are tribes who are civilization proof. Here are ruins of Spanish missions and villages built as long ago as the Mexican conquest. Here is the stamping ground of the famous frontiersman, Kit Carson, and the scene of innumerable invasions, conquests, rebellions, and Indian uprisings. The canyon walls that were once the haunts of the cliff dwellers, the awe inspiring depths and grandeur of the Grand Canyon of the Colorado, the lava beds of extinct volcanoes, the Painted Desert and the Petrified Forest are all accessible to the motor tourist.

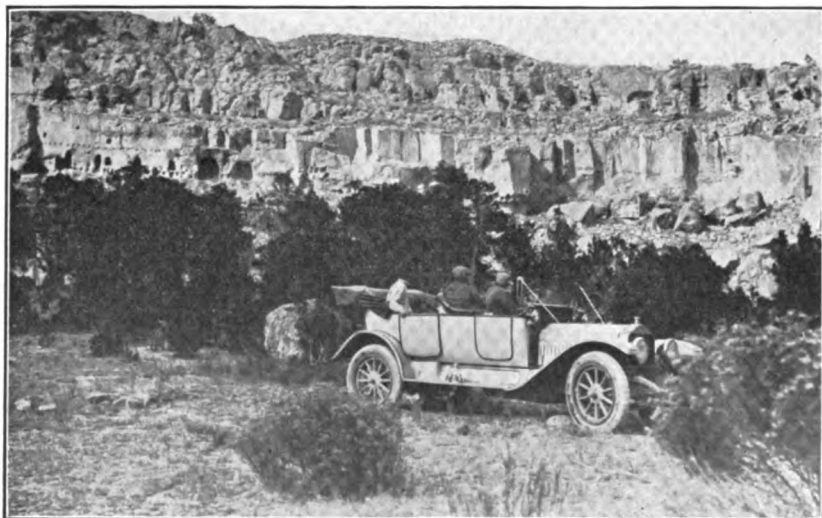
He may leave his car and explore the cells and passageways through solid rock, wrought by a race whose existence can only be computed in units of a thousand years. Or, he may drive to the very edge of abysmal chasms and gasp with amazement. Such was the experience of a party of motorists who set out to prove or disprove the recurring rumors of a race still faithful to the customs and mysterious legends of medieval times and a region of prehistoric ruins and natural wonders.

### Following the Santa Fe Trail.

Late in September, a White Six was shipped to Pueblo, Col., where the trip started. Picking up the historic old Santa Fe trail out of Pueblo, skirting the Rampart range of the Rockies and the towering Spanish Peaks, snow-bound and cloud-covered, the first day's ride brought the party into the Colorado coal fields and ended at

Trinidad. The recent miners' strike was then at its height. Dozens of strikers' tent colonies were visible in the hills. Villages were deserted except for a few vigilant mine guards, heavily armed. The following morning, still on the Santa Fe trail, they crossed Raton pass, from whose heights it was possible to make out, far to the west, the snow white line of the Sangre de Christo range. The descent from the pass was rapid, with many sharp twists and steep inclines, from which the tourists could look down upon the city of Raton.

South of Raton they took a branch trail veering off to the west over a plain leading to Cimar-

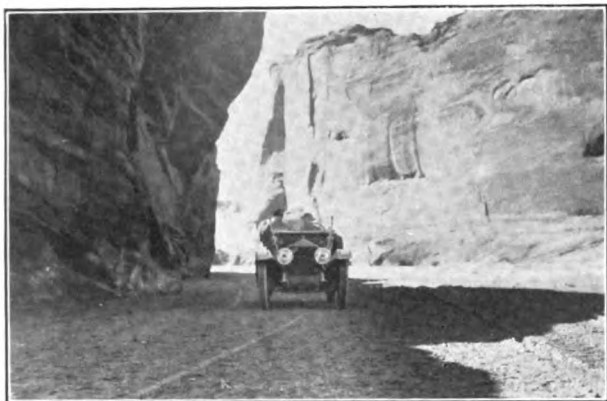


**The Cliffs at Puye Are Honeycombed with Cliff Dwellings and Cave Entrances as Far as the Eye Can See.**

ron canyon. A typical eyelash road winds along a little mountain stream, and passes the lofty Palisades, whose cliffs are curiously weather-beaten. Leaving the canyon, they crossed another level plain and commenced the ascent of the Taos mountains to Taos pass, whose altitude is over 9000 feet. Although the trail was through deep adobe mud, and there were many long steep grades, the White Six easily climbed the mountains without heating.

At Taos the tourist begins to wonder whether he has made a mistake and crossed the border into Mexico. It might just as well be Mexico, for





**The Walls of the Canyon de Chelly Rise Straight from the Sands to Heights of 1000 Feet, the Crevices Being Filled with Ruins of Cliff Dwellings.**

Taos is the most un-American place in America. The low adobe buildings, dating back for many generations, still surround the old Plaza. The population is almost entirely Mexican. Being far from the nearest railroad, the influences of modern times have left little impression on this secluded town. In a typical Taos saloon, just two pictures adorn the walls. One is a portrait of Diaz, the other of Madero.

#### **Kit Carson's Old Home.**

On a narrow street leading from the Plaza the tourists found the old home of Kit Carson, the most conspicuous figure in the frontier history of the southwest, while in a little cemetery on the edge of the town they found his simple grave. On one corner of the Plaza is the house in which Governor Bent was killed by the Mexicans and Indians during the Pueblo uprising at the close of the Mexican war. In fact, every house in Taos is closely linked with the stirring drama of the early days of the frontier.

While the tourists were in Taos, the Indians, the most independent and medieval of all tribes, were celebrating the day of their patron saint, San Geronimo, and practising wierd ceremonies at their pueblo three miles from town. Redskins from the entire surrounding country were on hand. Even the Apaches from the distant Jicarilla reservation and a few Navajos from Arizona were there.

From Taos, the White party started south along the headwaters of the Rio Grande, passing many villages whose low adobe houses were festooned with countless strings of chili, the

bright red of the peppers making a vivid contrast to the dull brown of the adobe walls. The road along the Rio Grande has many arroyos or gulleys of deep sand, requiring constant watchfulness. It is laid through half a dozen Mexican towns and an equal number of Indian pueblos all close to the river and all maintaining their ancient tribal customs and dress.

#### **Rocks of Fantastic Shapes.**

At Pojauque the trail leaves the river and runs up the side of a valley that is notable for the scenery, even if there were no strange villages and peoples to be seen. Far in the background the massive walls of the valley slope up, sharply topped by jagged rim rock in fantastic shapes. The valley itself is one vast confusion of mesas and arroyos, with a particularly impressive formation, the Black Mesa of San Ildefonso, towering high above the river. On top of this mesa the Indians made their last stand during the Spanish reoccupation under DeVargas in 1692. Winding around mesa after mesa and crossing dozens of arroyos, they finally reached the high land to the east of the river and drove the last few miles into Santa Fe over a beautifully scenic high road from which the entire surrounding country could be seen.

#### **In the Pueblo Country.**

And then they came to quaint old Santa Fe itself, a true relic of old Spanish colonization days, with adobe houses built right out to the edge of the streets. Through an occasional open doorway one can catch glimpses of delightful little placitas or courtyards. Stretching along one entire side of the Plaza is the old governor's palace in which the long line of Spanish, and later Mexican, governors held sway. Here it was that the Spaniards made their last stand before being driven out of the country by the Pueblos in 1680. After that it became the palace of Indian poten-



**Pueblo of the Taos Indians, the Most Independent and Medieval of All the Pueblo Tribes.**





**Making Friends with the Apache Nomadic Indians in the Heart of Their Reservation.**

tates for 12 years until it was recaptured by the same DeVargas who stormed the heights of San Ildefonso. It stands today practically the same as the Mexicans left it, but it is now occupied by the archaeological and historical societies.

One can spend many interesting days in Santa Fe delving into the early history of New Mexico. A delightful day's trip is eastward through Apache canyon, Canyoncito and Glorieta pass, to Pecos river and the ruined pueblo city of Pecos, whose entire population was wiped out by pestilence, but which was one of the most powerful in the days of the Spanish. Here are ruins of a church built in 1617 under the direction of the Franciscan monks. Reluctant to leave the Pecos ruins, the tourists retraced their route until they reached a road to the ruins of another ancient pueblo at San Cristobal, several miles south of Lamy. The ground was covered with pieces of broken pottery and stone utensils, indicative of semi-civilization. On a boulder strewn cliff near the ruins were many curious pictures and symbols, the picture writing of the ancient inhabitants.

#### **Relics of a Forgotten Age.**

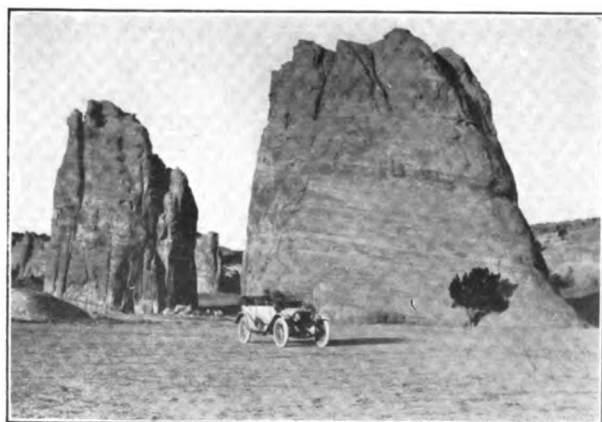
One should not leave Santa Fe without visiting the Puye cliff dwellings in the Jemez plateau. To reach this point the White Six was driven northwest from the city over creek bottoms, meza tops, sandy arroyos and high cliff roads. The Puye cliffs were literally honeycombed with cave entrances. Leaving the car they climbed a rocky trail and explored the caves. Then, with the aid of ladders left there by the Archaeological Society, they climbed to the top of the cliff and found the ruins of an enormous communal stone city, covering many acres.

These ruins are but one of hundreds that are to be found in the Jemez district—relics of a race whose existence antedates every historical

record. From Santa Fe they headed south for Albuquerque. A drive of 20 miles over a good stretch of road ended abruptly at La Bajada hill, where there is a sheer drop of many hundreds of feet into the valley below. The road down the side of the cliff is new, but not designed for cars of a long wheelbase. It was necessary to use the reverse gear on every one of the turns, and also necessary to have powerful brakes, a feature of the White Six that was often appreciated by the occupants of the car.

Crossing the valley and continuing southward they passed the pueblos of Santa Domingo, San Felipe and Sandia, and then fringed the foothills of the Sandia mountains until they reached Albuquerque. Westward from Albuquerque are the pueblos of Isleta and Laguna, built along the railroad, accessible to tourist travel and looking much the worse on account of it. At El Moro, or Inscription Rock, one can see the names and dates of early Spanish explorers carved in the rock with the sword's point. The trail leads to one of the largest Indian settlements in the southwest, the pueblo of Zuni, and here the tourist may see all that remains of the fabulous Seven Cities of Cibola, which inspired the first Mexican exploration of this region. From Zuni the trail leads southwest to St. Johns and Springerville over a fairly good road.

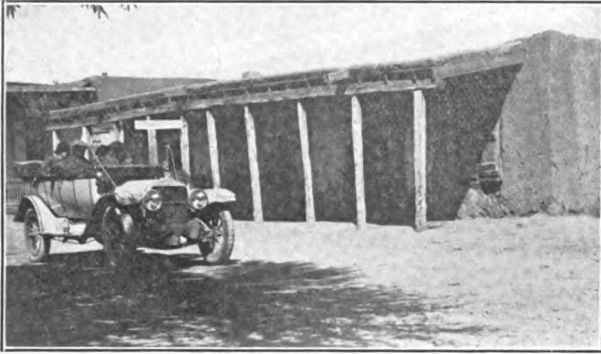
Two days were spent in making trips out of Springerville to the White river country, driving through the tall pines of the Apache forest reservation to Fort Apache, situated in the heart of the reservation. The Apaches differ absolutely



**The Haystacks, Curious Rock Formations in the Black Creek Valley East of St. Michaels.**



from the Pueblos. They are nomadic, living in little huts built of boughs and mud, and are more or less dependent upon government bounty. The



**Kit Carson's House in Taos, the Old Headquarters of the Famous Frontiersman.**

night was spent at the fort, and the following morning they returned to Springerville and St. Johns, where they turned north with the Little Colorado river toward Holbrook. A few miles east of Holbrook they entered the Petrified Forest national monument, a strange formation covering many acres, with giant petrified trees lying, half covered with sand, in utmost confusion.

#### **Evidence of Extinct Volcanoes.**

From Holbrook the car was driven west to Winslow and Flagstaff, at which point it was headed north along the lofty San Francisco mountains, and through a nest of extinct volcanoes. The ground was covered with malapai rock, or broken lava, and here and there the black lines of ancient lava flows were plainly visible. Finally they emerged from the volcanic belt and entered the cooling shade of the Tusayan Forest reserve, whose giant pines border the southern line of the Grand Canyon.

The first glimpse of the canyon was obtained from Grand View, 15 miles east of the canyon station. The car was driven out on Grand View point, and the occupants looked down into the great chasm which extends many miles. The first view of this greatest of natural wonders can never be forgotten. The sense of realization is completely overwhelmed by its vast depths and formations. Only a small part of it can be seen at one time. Even pictures fail to depict its grandeur, but, insufficient as they are, the photographs give some idea of this incomparable canyon. Two of the best side trips from Grand Canyon station are the drive along Hermit Rim road and the descent of Bright Angel trail into the depths of the canyon.

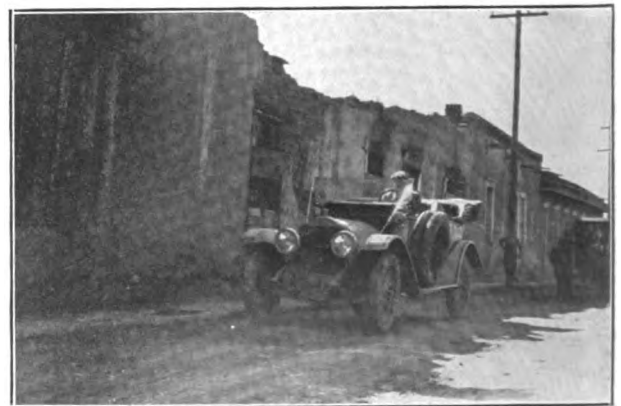
After a day of frenzied excitement, the tourists returned to Holbrook and struck north

across the Painted Desert to the trading post at Ganado in the Navajo Indian reservation. During the drive across the desert they encountered a great deal of heavy sand and many bad washes, where a car less powerful than the White Six might have difficulty. But the vivid hues of the Painted Desert with its fantastic mesa formations terraced against the horizon, more than compensated for the difficult travel. The desert is one tremendous sweep of color with every shade of red, brown and yellow outlining the various rock strata of the mesa cliffs. It was dark when the car pulled into Ganado. The party was cordially received by John Lorenzo Hubbell, one of the earliest Indian traders, who is famed for his hospitality and his activities in the frontier life of that region.

#### **Defying the Quicksands.**

Continuing the trip from Ganado the following morning, the tourists turned east to Gallup, where several days were spent in making side trips. Chief among them was a region concerning which wonderful stories had been told. Far north in the Navajo reservation are the Canyons de Chelly and del Muerto. Situated a hundred miles from the railroad they have been practically undiscovered by the tourist. No automobile had ever entered the canyon because of the quicksand.

Starting from Gallup the car was driven up the Black Creek valley to Fort Defiance, where the trail, gradually rising, enters a forest reserve and then drops rapidly down a rough and rocky road to Chin Lee, a trading post only a short distance from the canyon. The astonished traders at Chin Lee doubted that the car would be able



**Ruins of the Old Exchange Hotel, the Terminus of the Santa Fe Trail in the Early Frontier Days.**

to get into the canyon but, with their assurance that a searching party would start out if the White Six did not return by dark, the tourists



resumed the trip. It was a hard pull. The sand was the worst ever encountered by anyone in the party, but by deflating the rear tires a little they managed to reach the mouth. Once inside they proceeded slowly and cautiously, keeping a sharp lookout for the inevitable quicksand. They found plenty of it, but managed to keep the White Six out of it.

#### Home of the Cliff Dwellers.

The walls of the canyon are close together, and rich red in color, rising absolutely straight up from the sand to heights of a thousand feet. The crevices are filled with ruins of cliff dwellings and ornamented with picture writings. One particularly impressive cliff, five miles up the canyon, known as La Casa Blanca, or The White House, is so well preserved that it looks as if it might still be inhabited. How the dwellings were ever reached by human beings without wings is a puzzle. Many of them are built hundreds of feet up in the face of the cliffs with nothing but an absolutely smooth perpendicular wall above and below.

By following the bed of the stream eight miles further they reached a giant monolith of stone, known as El Capitan, rising a thousand feet in the air from the bottom of the canyon, a most impressive monument to the wonderful workings of nature. In fact the entire Painted Desert country from the Grand Canyon on the west to the Canyon de Chelly on the east is almost beyond conception, on so great scale has nature designed it.

From El Capitan the tourists returned safely to Chin Lee with the distinction of being the first motorists to enter the depths of the marvellous Canyon de Chelly. The next day they returned to Gallup, completing a 2500-mile trip through our little known southwest, nearly every mile of which is unrivalled by any part of the globe.

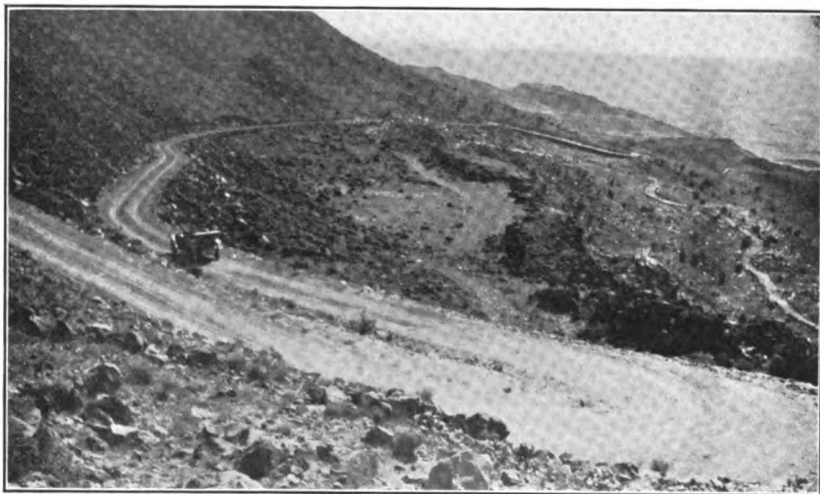
In the Christmas number of *The Haynes Pioneer*, published by the Haynes Automobile Company, Kokomo, Ind., Elwood Haynes contributes the sixth of a series of articles on his life and inventions. In this article Mr. Haynes recalls his early experiences with the "horseless carriage", including an account of the occasion when he was ordered off Michigan boulevard in Chicago in 1895.

#### WILL EXHIBIT AT NEW YORK.

#### Lyons-Atlas Company to Display Lyons-Knight Car at the Grand Central Palace.

The Lyons-Atlas Company, Indianapolis, Ind., maker of Lyons-Knight automobiles, will exhibit its product for the first time in the national show at New York City in January. The company has secured space in the Grand Central Palace, and in addition to four complete models will exhibit a number of parts.

The new machines are expected to attract considerable attention, as they have a number of interesting features, including a Knight sleeve valve motor and a worm-driven rear axle, this combination being made for the first time in this country and one making for silent operation.



**The White Six Descending La Bajada Hill, a New and Winding Grade with Many Hairpin Turns.**

The models to be displayed include five and seven-passenger touring, five-passenger Sedan and seven-passenger Berlin bodies. In addition to these, two complete model K4 Lyons-Knight motors will be shown.

Because of recognized efficient and loyal service to the Studebaker Corporation, Detroit, the following men have been elected to high official positions: First vice president, A. R. Erskine, also retaining his position as treasurer; vice president in charge of engineering and production, James H. Heaslet, formerly chief engineer; vice president in charge of automobile distribution, Ernest R. Benson, formerly sales manager; sales manager of automobile division, Arthur I. Philip, formerly assistant sales manager; assistant treasurer, Charles D. Fleming; auditor, H. E. Dalton.



## HINTS FOR NEW CAR OWNERS.

### Operation and Adjustment of Clutch Brake on Hupmobile---Components of K-R-I-T Multiple Disc Clutch and Attention Necessary---Cadillac Steering Gear.

ONE of the causes of the difficulty in changing speeds with the sliding type of gearset transmission is spinning of the main shaft. Some makers fit a brake or clutch stop which, when adjusted properly, produces sufficient friction to slow the clutch so that the desired gears may be meshed.

A clutch stop is fitted to the model H Hupmobile and this device comes into operation automatically when the pedal is depressed slightly beyond the point necessary to disengage the clutch. The action of the brake is shown in an accompanying illustration. When the clutch is disengaged, the throw-out moves up against an annular friction disc which is secured to the

work the oil between them, after which the housing should be drained and refilled with lubricant.

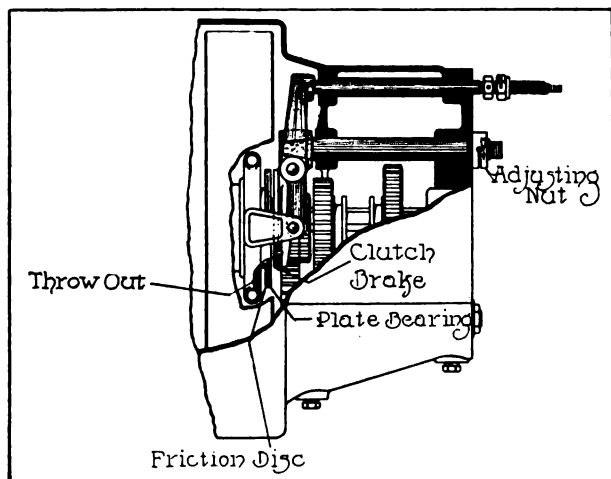
#### ADJUSTING K-R-I-T CLUTCH.

A smoothly operating clutch is desirable, and when it bites or slips it should be inspected and adjusted if necessary. With the multiple disc type the lubricant should be removed from time to time, the discs flushed with kerosene and the oil supply renewed. This type rarely gives trouble if properly cared for, but if foreign elements work into the lubricant the plates are likely to become cut.

The K-R-I-T clutch comprises 10 large steel discs and 11 smaller members, as shown in an accompanying illustration. While it will appear that the large discs are similar, four are left hand and six are right hand. The reason for this construction is obvious. By placing one disc on top of the other it will be noted that the small springs cut in the edge of the disc do not bear together, and that the 11 smaller discs C are interleaved between each of the 10 larger members. The latter fit onto three pins securely fastened to the flywheel and the small discs are secured to the clutch drum or body A, which revolves freely on the end of the crankshaft, and to which the gear K is fitted.

The discs are held in place on the drum by the three adjustable eye bolts D. To these are secured the toggles E E, one end of which bears against the disc plate F, the other end of the toggle bearing against the cone G, in the bore of which is located a strong spring H. The action of this spring against the cone toggles, etc., is to keep the large and small discs together. The clutch pedal is connected to the clutch by means of a shaft and two pawls which fit into a groove I, and when the pedal is pushed forward or depressed its motion pulls the cone G back, thereby releasing the pressure from the 11 small discs, permitting the flywheel to revolve the large discs without rotating the small ones and subsequently revolve the gear K.

The discs operate in oil and should the clutch slip should be flushed with a gallon of kerosene. Depress and release the clutch several times and crank the motor to allow the oil to work in be-



Clutch Brake or Stop Utilized on Model H Hupmobile and Parts Employed in Adjustment.

clutch follower plate bearing. The last named makes contact with the clutch brake, thereby creating between the parts sufficient friction to reduce the speed of the clutch shaft so as to permit the meshing of the desired gears.

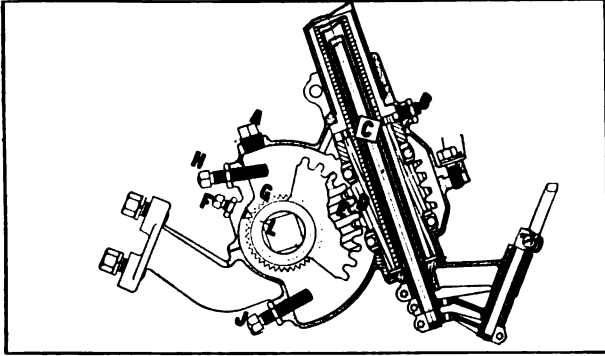
If the clutch brake does not make contact with the clutch follower plate bearing when the pedal is fully depressed, an adjustment should be made. This is performed by moving the adjusting nut in an anti-clockwise direction, as shown by the arrow in the drawing, until a contact is made between the brake member and plate.

Efficient operation of the clutch will be obtained by occasionally flushing the plates with kerosene, engaging and disengaging the discs to



tween the plates. Remove all kerosene and replace with fresh lubricant.

To adjust the clutch the pedal is fully de-



**Steering Gear of 1913 Cadillac with Components Lettered to Make Easy the Work of Eliminating Lost Motion.**

pressed, which will bring the cone G towards the bearing J. To hold the clutch out place a stick against the pedal or place some object between the cone G and the hub of clutch D at X. Remove the pin passing through the eyebolt D and make one turn to the right. Replace toggle pin and adjust the next toggle in the same manner, also the third member.

### CADILLAC STEERING GEAR.

Owners of new cars will do well to comply fully with the instructions of the maker as to care and maintenance, and this applies particularly to the steering mechanism and its linkage. The steering gear is not only well designed and constructed of a high grade material but, as with any mechanism subjected to friction, requires lubrication and attention. The maker of the 1913 Cadillac provides two places for the insertion of the lubricant and these are indicated at A and C in an accompanying illustration, which shows a sectional view of the steering gear.

When the owner neglects to lubricate the mechanism wear naturally follows, resulting in end play of the steering column and lost motion in the wheel. Any play should be removed and provision is made for adjustment.

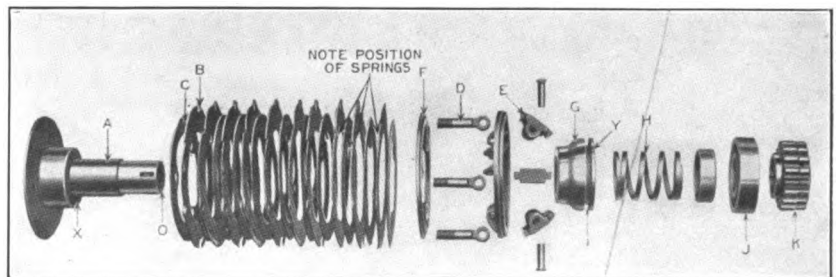
To eliminate end play loosen the jamb nut and set screw B, and remove the plug C. This will permit of reaching with a screw driver the adjusting collar, which is provided with a number of recesses, into one of which the screw mem-

ber B is inserted for locking purposes. This collar should be adjusted carefully and the column tested for free movement. It is best to jack up both front wheels in making adjustments to the steering gear and its linkage.

Wear of the worm D and sector E is compensated for by rotating a pair of eccentric steel bushings in which the sector has its bearings. To obtain access to the bushings, remove the two set screws F, which are on either side of the sector. But one is shown in the drawing. This will enable the bushings G to be seen. By means of a wrench the hex heads on bearing bushings are turned forward, moving the sector toward the worm, one notch of the bushings or more as may be necessary. Usually one notch will be sufficient. It is important that both sides be turned exactly alike, otherwise the gear will be thrown out of alignment. H and J are set screws for limiting the range of movement of the steering gear and front wheels; that is, they may be so set that the maximum movement of the wheels will not permit of the tires touching the springs. For lubricating the steering mechanism the maker recommends oil and flake graphite.

At the 28th regular monthly meeting of the Metropolitan Section, Society of Automobile Engineers, in New York City, Dec. 18, papers were presented on two subjects: "Graphite as a Lubricant for Automobiles" and "Lubricating Greases for Automobiles".

The following concerns have been elected to membership in the Motor & Accessory Manufacturers: Dunlop Wire Wheel Corporation, 2130 Broadway, New York City, maker of wire wheels; Grant-Lees Gear Company, 6901 Quincy avenue, Cleveland, O., gears; Sulzberger & Sons Company, 41st street and Ashland avenue, Chi-



**Showing K-R-I-T Multiple Disc Clutch Disassembled to Make Clear the Operation of Parts and Method of Adjustment.**

cago, curled hair; American Gear & Manufacturing Company, South Park avenue, Jackson, Mich., automobile axles.



## IN THE COMMERCIAL VEHICLE FIELD.

### White Wagons Give Excellent Economy in Department Store Delivery Service-- Tractor for Work on Small Farm--Boston's General Utility Machine.

**S**EVEN White machines, made by the White Company, Cleveland, O., in service with the Sterling & Welch Company, of that city, have given excellent satisfaction. The concern operates a large department store, dealing in furniture, carpets and household furnishings. The first cars were purchased in May, 1910, these being with capacity of 3000 pounds. Others were added in May, 1911, and in April, 1912. Three are 1500-pound wagons and the remainder of the larger capacity. The entire equipment is shod with pneumatic tires.

Immediately after deciding upon the adoption of motor delivery, the concern selected horse drivers and trained them in the operation of the automobiles. It established a garage and fitted

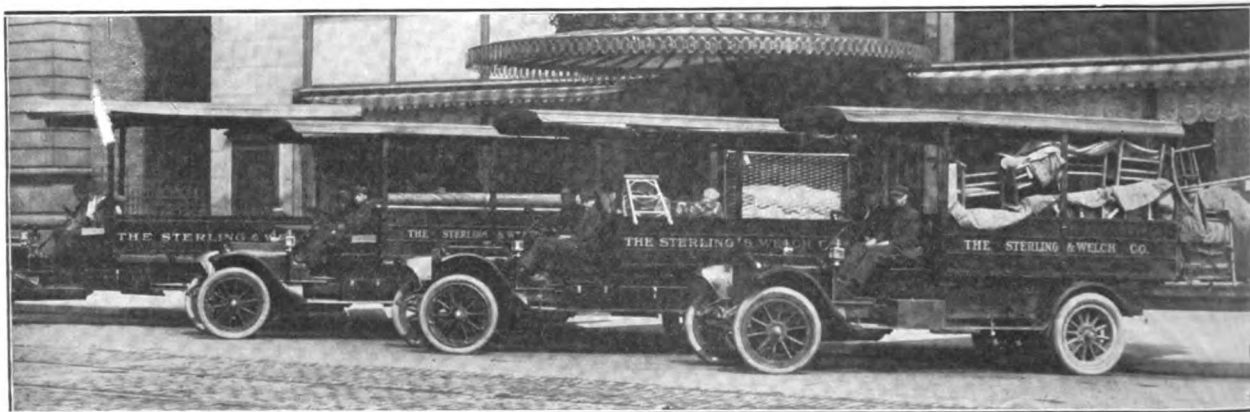
uring depreciation at 20 per cent. a year. The pneumatic tires have averaged 4000 miles each.

The wagons are driven an average of 62 miles daily and make 65 stops. The company's officials believe that from 40 to 45 horses would be necessary to do the work now done with the trucks.

#### TRACTOR FOR FARM WORK.

**Holmes Little Giant Is Designed to Replace Horses Wherever Practicable.**

The success which has attended the use of mechanical tractors on the large farms of the Middle West and Canada has impelled designers to turn their attention to the production of ma-



Four of the Seven White Wagons in Service with a Large Department Store in Cleveland, O.

it with such equipment as was necessary to maintain or repair the machines, and employed a man whose duty it was to see that they were at all times in condition for service. Although this garage is located near the White factory, none of the wagons has ever been sent to the maker for work.

Concerning their economy, it is stated by the owner that in November, 1912, three of the machines, which had been driven approximately 40,000 miles each, were overhauled and completely restored after 2.5 years' service at a cost of about \$100 each. One of the wagons first bought was recently overhauled, after having been driven 65,000 miles, in 3.5 years, and the cost of parts used in restoration was \$35, despite the fact that it had been in use for 70 per cent. of its life, fig-

chines of this character which shall be adaptable to the small farm. The Holmes Tractor Company, Port Clinton, O., is producing the Holmes Little Giant tractor, shown in an accompanying illustration, which is intended to replace horses in work of this character. It may also be utilized as a power plant for husking, shredding, pumping, grinding, sawing and, in fact, for any service for which a stationary engine may be required.

The capacity of the tractor is maintained to be equal to that of two two-horse teams for field work, and on the road it is stated that it will haul more than two double teams when trailers are used. The design is exceedingly simple and the mechanism is very accessible, so as to minimize care and attention.





**Holmes Little Giant Tractor Hauling the Plow.**

The length over all is 138 inches, the width 72 inches and the height 54. The weight is 4400 pounds. The chassis frame is of channel steel, with sturdy cross members, and this is mounted at the forward end on an I section axle, which carries a triangular bracket, at the apex of which is a trunnion on which the axle may swing, so that with one front wheel elevated or depressed there is no strain on the chassis. The rear end of the frame is mounted on springs, and the drive from the rear axle is through radius rods.

The motor is of the conventional four-cycle, water-cooled, two-cylinder opposed type, with bore of 5.5 inches and stroke of five. This is rated at 12 horsepower by the maker. It is mounted longitudinally in the frame, with the crankshaft extending transversely, and on this, outside the flywheel, is the driving sprocket and power transmission gearset, of the planetary type. The drive to the jackshaft is by a chain from the engine shaft, the chain extending to a differential gear mounted on a sleeve.

The front wheels are 36 inches in diameter and have steel rims five inches wide, in the centre of which is a ring that extends around the circumference to prevent side slip. The rear wheels are 40 inches in diameter and the steel rims are 10 inches wide, these being fitted with diagonal affording traction on cleats across the face, any yielding surface. The hubs and spokes are of steel, with the

latter set in two series, separated practically the width of the hub and closer together when fitted in the rims.

### NOVEL COMBINATION WAGON.

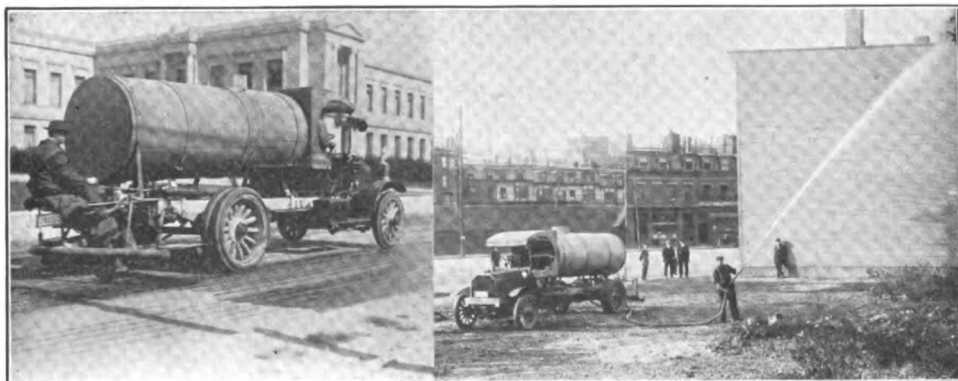
**Interesting Experiment Which Has Proved Entirely Practicable in Boston.**

The city officials of Boston have been experimenting with a Peerless three-ton truck chassis and combination body installation with results which may suggest decided possibilities for smaller cities and towns. It was not thought that any one of the odd jobs for which it was planned to use the truck would afford sufficient opportunity to keep the machine busy all of the time, and the combination arrangement was decided upon in consequence.

When first purchased the chassis was fitted with a dumping body and power hoist, and this was utilized by the health department for the collection of ashes, refuse and garbage. To provide for the needs of the street department, a 900-gallon steel tank was added and with this was supplied a rotary pump to afford such pressure as was necessary for the distribution of both oil and water.

The tank is carried on a cradle of angle steel and connection is made with systems of piping so that when desired oil may be forced under a predetermined pressure through a header carried directly beneath the end of the tank. The flow of oil is controlled by a lever that is operated from a seat mounted at the rear.

For water sprinkling a larger curved header is mounted back of the oil header, and the temporary seat is removed. The water outlet to the header may be closed and another outlet connected to a two-inch hose, through which the pump will force a stream a considerable distance.



**At Left, Peerless Combination Vehicle as an Oil Spreader; at Right, Fighting Fires.**



## CORRESPONDENCE WITH THE READER.

**Cadillac Valve Dimensions.**

(1679)—To settle an argument and to save the trouble of removing the parts from the car, will you publish the dimensions of the valves fitted to the Cadillac 30 automobile?  
CADILLAC OWNER.

Jackson, Fla., Dec. 8.

The dimensions of the valves utilized on the Cadillac 30 motor are given in the drawing at Fig. 1, which was supplied by the engineering department of the Cadillac Motor Car Company of Detroit.

**Magneto Trouble.**

(1680)—What is the cause of my motor operating after I have thrown the switch lever to the "off" position? I have two different ignitions, a battery and a distributor, and a high-tension magneto. I start on the battery, then switch to the magneto, but sometimes when the lever is moved to "off" the motor keeps running, and I have to stop it by stalling it.

Hartford, Conn., Dec. 20.

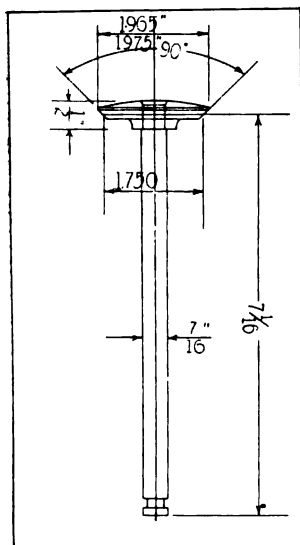


Fig. 1—Cadillac Valve and Stem.

chassis. When the lever is moved to the "off" position, a path is completed for the primary current of the magneto, the electricity flowing from the instrument to the metal or ground. This diverts it from the secondary windings, as previously explained.

Examine the connections carefully and make sure that the circuit is closed when the switch is moved to the "off" position. It is not necessary to stall the motor when the switch is inoperative. By taking a piece of metal, a screw driver blade for example, and making a connection between the terminal on the circuit breaker and any metal of the car, the primary current will be diverted.

**INFORMATION.**

The fault is presumably in the switch or connections thereto. With the true high-tension magneto, the primary and secondary current are generated in the instrument itself, the first named being diverted from the secondary windings when it is desired to stop the operation of the motor. A wire is led from a terminal on the circuit breaker housing of the magneto to a switch, and another lead is from the twitch terminal to a metal part of the

**Parts for Maxwell.**

(1681)—Is it possible to obtain parts for a two-cylinder Maxwell runabout, the type made several years ago by the Maxwell-Briscoe Company?  
Media, Penn., Dec. 15.

The Maxwell Motor Company, Inc., Detroit, announces that it is able to supply parts for the car mentioned within 48 hours from the receipt of the order. The company has a stock of parts for over 150 different models of machines made by the former United States Motor Company and they may be ordered direct or from any recognized dealer or repairman.

**Boiling Point of Kerosene.**

(1682)—1. What is the cost of sulphuric ether and of oxygen? 2. What type of nozzle breaks gasoline up into the finest spray? 3. What is the boiling point of kerosene? 4. Would the exhaust gases of a motor be sufficiently hot to boil kerosene? 5. Will it do an E-M-F car any harm where the transmission is geared so high that the second speed must be used about half the time, the second speed being about 4:1? Will the fact that it is not direct on the second make any difference?  
W. J. B.

Washington, D. C., Dec. 9.

1. The price of sulphuric ether and oxygen can be obtained at any chemical house or wholesale druggist.

2. The best type of nozzle is a matter of opinion. This is evidenced by the standard designs employed.

3. The boiling point of kerosene ranges from 302 to 572 degrees Fahrenheit at a specific gravity of .753 to .864.

4. The temperature of the exhaust of a motor would be sufficient to boil kerosene, as it is several times that necessary.

5. Continued use of the second speed of the gearset will result in wear of the gears and bearings, and with the ratio mentioned is likely to impose stresses upon the motor, etc., not obtained with conventional gearing. That originally installed by the maker is to be preferred to higher ratios unless the machine is to be utilized for racing purposes.

**Autocar Wheel Bearings.**

(1683)—Are the front wheel bearings of the two-cylinder Autocar runabout of the roller or ball bearing type and adjustable?  
SUBSCRIBER.

Washington, R. I., Dec. 16.

The car mentioned was constructed both with roller and plain bearings and neither are adjustable. With the last named design the parts have to be bushed.

**Bothersome Missing.**

(1684)—I own a four-cylinder car of ancient vintage. It has given good service until recently, when it



Wyoming, R. I., Dec. 17.

Remove the cover and have someone crank the motor with the ignition cut out, and observe the action of the roller. If the timer is loose or wobbles with the motor operating, adjust the bearings, or if of the plain type fit a new bushing. Timers are not expensive and it may be cheaper to purchase and install a new one. Always keep a commutator clean and well lubricated.

(1685)—Who makes the four-cylinder motor used in the Corbitt car? What is the timing of the motor; that is, the opening and closing points of the intake and exhaust valves? CORBITT OWNER.

Binghamton, N. Y., Dec. 14.

The timing diagram is presented at Fig. 2, with the opening and closing points marked off, also the piston travel in inches. This will permit of timing both by the flywheel and piston travel methods.

(1686)—I note that the Prest-O-Lite tank I placed on my car recently does not register as high as it did when I bought it from the service station; that is, after placing it on the machine it showed less capacity than in the store. The tank was not used. I tested for leaks but could not find any. What causes the difference?

W. L. D.

**Boston, Dec. 17.**

The difference is due to the change in temperature, as will be noted by placing the tank in a warm room after it has been exposed to the cold. It does not, however, affect the capacity, as there is as much service to be obtained as under normal conditions.

## Motor & Accessory Manufacturers Will Have Three Busy Days in New York.

Following its custom of holding the annual meeting during the progress of the annual na-

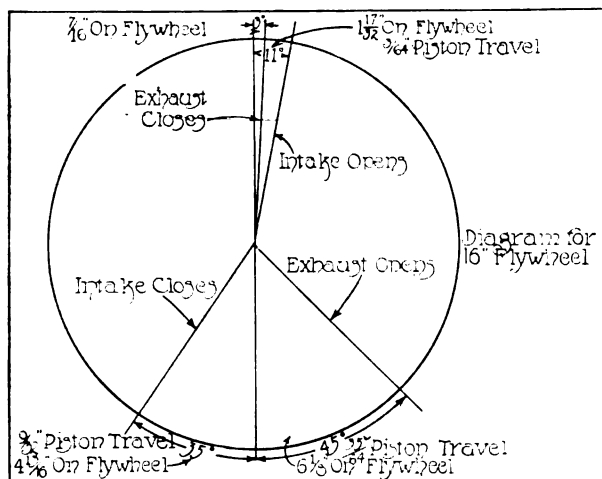
Tuesday, Jan. 6—Executive committee meeting, association's office, 17 West 42nd street, 10 in the morning; board of directors, 10:30; banquet committee, immediately following the board of directors; finance committee, 2:30 in the afternoon.

Wednesday, Jan. 7—Eleventh annual meeting at Waldorf-Astoria, 3 in the afternoon; sixth annual banquet at the same hotel, 7:30 in the evening.

Thursday, Jan. 8—Meeting of board of directors at the association's office, 11 in the morning.

**Goodyear Company Announces a New Product  
Designed Particularly for Tourist Work.**

The Goodyear Tire & Rubber Company, Akron, O., maker of Goodyear tires, is announcing a heavy tourist inner tube, which will be 30 per



**Fig. 2—Timing Diagram of Hazard Motor Used with Corblitt Car.**

cent. thicker than the ordinary tube. It is also stated that the rim side is reinforced, being 50 per cent. thicker than the balance of the tube, which is held to protect it from rim rust and chafing and to reduce pinching to a minimum.

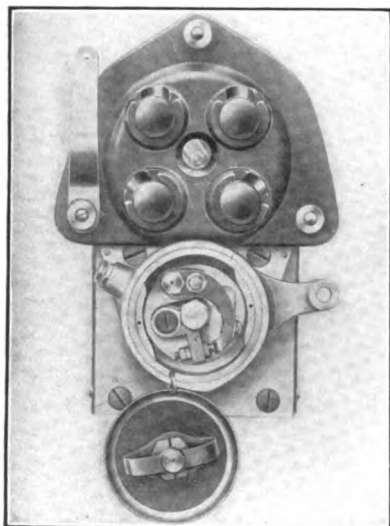
The new Goodyear tube is made of pure Para rubber, a factor of no little importance in fulfilling the requirements necessary in a tube capable of giving long service. It is pointed out that the use of this material makes necessary a special process of vulcanization, which is also held to be of further value to the owner.

The December number of the Bulletin, a publication devoted to the interests of the Manhattan Automobile Club of New York City, contains a number of timely articles, several of which deal with legislative subjects.



## SPLITDORF ANNOUNCES NEW MAGNETO.

**T**HE Splitdorf Electrical Company, Newark, N. J., is marketing a new magneto, termed the EU4, which is of the true high-tension type



**Splitdorf EU4 True High-Tension Magneto.**

and designed to meet the demand for an instrument providing a hot spark at all motor speeds, as well as to make starting easy.

The new instrument is water and dust proof and is constructed throughout on a principle of strict utility combined with a neat appearance, and has sufficient

reserve energy for a 30 horsepower high speed motor. The design embodies an aluminum base to which the pole pieces are secured, and between the latter revolves the armature on two annular ball bearings. The armature, after being wound, is impregnated with a heat and oil proof compound which the maker states renders it practically indestructible. Mounted over the armature is the condenser, this being clamped between two metal plates, which are secured to the pole pieces. The function of the condenser is to increase the intensity of the spark and to reduce the wear of the platinum contact points of the circuit breaker.

The magnets are of the best grade tungsten steel and straddle the pole pieces. Water, dust and oil proof qualities are obtained by fitting a cover over the end plates. The circuit breaker is attached to the armature shaft as shown in the illustration and revolves with it. Owing to centrifugal action the platinum points come in contact in a positive manner at high speeds, thus permitting of the utilization of a spring with light tension, a construction reducing wear of the cam to a minimum. These and other similar refinements are stated to be the subject of patents and exclusive Splitdorf features. The break in the primary circuit is obtained by a roller coming in contact with a steel cam, separating the platinum points.

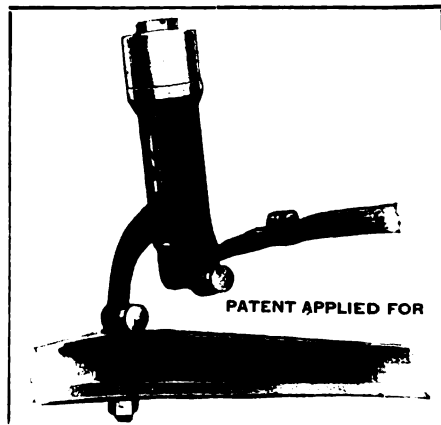
The high-tension winding on the armature is connected to a collector ring or segment, imbedded in a spool mounted on the driving end of the armature shaft. From the brass segment a carbon brush leads the current through a water proof brush holder, having a detachable plug, to which the cable leading to the spark plug is connected.

The cam holder may be shifted to the extent of 23 degrees, enabling a liberal advance or retard of the spark in timing. A pin, suitably located on the rim of the cam holder, comes in contact with the cover spring when the cam holder is in the extreme retarded position, thus grounding the primary current and stopping the operation of the motor.

Special care has been taken in the manufacture of the Splitdorf instrument to prevent leakage of the high-tension current in the connections and cables leading to the spark plugs. Among the qualities emphasized in the new instrument are easy installation and inspection. As is the case in all true high-tension types the wiring is simplified, there being but one lead, in addition to the high-tension cables.

### J. H. S. FORD SHOCK ABSORBERS.

In the description of the new J. H. S. shock absorbers for model T Ford cars, made by the J. H. Sager Company of Rochester, N. Y., appeared an illustration showing the J. H. S. attached to a car having platform springs. It should have been the J. H. S. fitted to the front springs of a Ford machine. The correct illustration is shown herewith and the simplicity of attachment will be noted. The



**J. H. S. Shock Absorber as Attached to Front of Ford Cars.**

The J. H. Sager company is making a special offer to owners of Ford cars and the guarantee accompanying the absorbers is unusually liberal.



## MECHANICAL NOTES FOR OWNERS.

### Suggestion for Installing Priming Cup on Dash--Lubricating Spark and Throttle Connections--Removing Dust from Electric Headlights--Heating the Carburetor.

THE adoption of the electric motor starter has not wholly solved the problem of starting a motor when cold. The system fulfills its function of spinning the crankshaft, but unless the cylinders be provided with an inflammable mixture the engine will not start. The new owner should bear this in mind when attempting to start his motor after it has been exposed to very low temperatures and for a considerable length of time. The most practical method is to carry a cup of priming fluid and inject a little through the petcocks before attempting to utilize the electrical equipment. This will not only save time, but will husband the storage battery.

While some makers provide attachments for heating the carburetors others do not have such an arrangement, although means are included for enriching the mixture for starting. The following suggestion is contributed by a reader whose car is fitted with an electric motor starter. He states that it can be installed easily and at a slight cost, and that it has given perfect results in cold weather.

Noting that you have published suggestions from readers, I am inclosing a priming device that I worked out and fitted to my machine, which has an electric starter. I found that in extreme cold weather I could not start the motor without priming, and as it was troublesome to lift up the hood, open and prime through the petcocks, I devised the plan shown in the accompanying sketch.

I secured a suitable length of annealed copper tubing to reach from the intake manifold to the dash. You will note that I made a coil in the pipe to eliminate opportunity of breakage through vibration, a plan used in gasoline systems. I tapped the intake manifold to screw in a connector to which I fitted one end of the tubing. The other end was carried through the dash and anchored. To this end was fitted an elbow to take a priming cock.

When I wish to start on a cold day I open the petcock and pour in a mixture of gasoline and ether, which I carry in a ground glass stopper bottle. The fluid flows to the walls of the intake pipe, making a rich mixture and one that will start the engine easily when the motor starter is operated.

The device has another advantage in that it permits me to use a slightly rich mixture, for by opening the petcock I can supply auxiliary air. The plan can be employed on cars not fitted with motor starters and I trust you will publish the drawing, as it will be of assistance to other owners who experience trouble in starting on cold days.

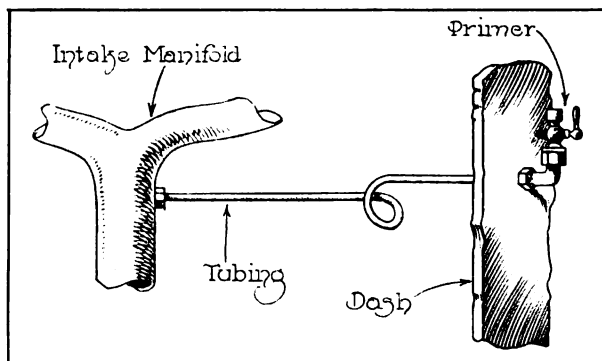
#### A LUBRICATION HINT.

Few motorists give the linkage of the spark and throttle connections attention, which generally results in lost motion. When these are of the ball and socket type they should be cleaned

with gasoline to remove all foreign elements and lubricated. The writer has obtained excellent results by making a thick mixture of grease and powdered graphite, forcing it into the socket. In preparing the mixture use as much graphite as the grease will take.

#### CLEANING ELECTRIC HEADLIGHTS.

When electric reflectors are fitted to the gas headlights, more or less dust will find its way into the lamp unless the doors are absolutely tight. To clean them satisfactorily it is desirable to remove the reflectors from the lamps and



Suggestion of a Reader for Priming Intake Manifold from Dash.

blow out any dust which may have collected in them. The reflectors can be cleansed by dipping a small piece of absorbent cotton in alcohol and wiping the surfaces lightly, and always from the front to the back. Care must be taken not to use any material which will scratch the faces of the mirrors.

#### A STARTING HINT.

J. D. E. of Pittsburg, Penn., contributes the following suggestion for starting a cold motor in the garage:

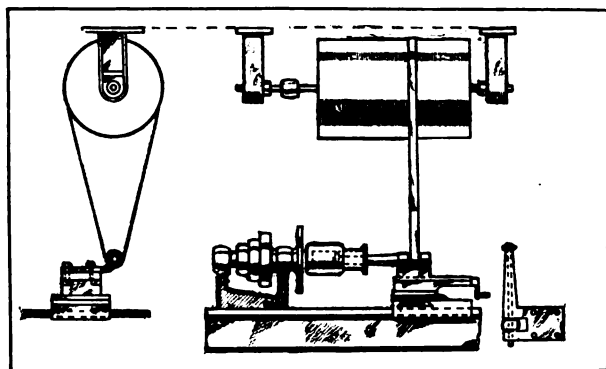
I am contributing the following suggestion for starting a cold motor in the unheated garage. I use my machine in my business and store it in a building which is not heated. Before breakfast I place a drop light in proximity to the carburetor and turn on the electric current. I cover the hood and radiator with a blanket and by the time I have finished breakfast the carburetor and intake pipe are warm enough to make starting fairly easy.



## SUGGESTIONS FOR THE REPAIRMAN.

### Constructing Grinding Attachment for the Lathe Adaptable for Either Internal or External Work and Eliminating Floating Countershaft---Drilling Holes in Glass.

THE equipment of the modern repair shop includes a grinding machine, as it is recognized as an indispensable tool. In some establishments, however, such an equipment is not always installed and the work is sent out to another concern. Some machinists display considerable ingenuity in building grinding attachments for the lathe and an accompanying illustration presents a plan, the inventor of which was awarded the weekly prize by the Commercial Motor, an English publication. It will be noted that the design does not employ a floating countershaft. With it the inventor claims he is able to grind hardened steel spindles, camshafts, crankpins, valves, cylinders, etc., and states that in planning the attachment considerable thought was given to have the equipment as rigid as pos-



Grinding Attachment for Lathe, Permitting of a Variety of Internal and External Grinding.

sible and that all parts operated on it should be ground quite circular.

The maker states that the attachment can be used either for grinding internal or external work and that it can be fitted easily to the ordinary lathe. The left hand figure shows the end elevation, and that at the right the grinding spindle and method of attaching it to the tool clamp of the top portion of a compound slide rest. The smaller figure shows a plan of the grinding arm itself, which is somewhat after the style of a Landis grinder. The attachment can be made fairly easily, but if desired can be purchased. For internal work it is provided with a long arm, but for external work the latter is only about three inches in length.

A small pulley for driving the arm is seen located between two bearings, so that it will be realized that there is no overhang to set up vibration. The method of driving the spindle consists of a pair of hangers placed in front of the ordinary overhead shop shaft, and about central with the lathe, so that the attachment can travel about six inches on either side without materially altering the relative position of the driving belt.

The driving drum consists of two 12-inch diameter pulleys about two inches wide. These are placed about three feet apart, and then lagged with strips of wood one inch in width, these being placed lengthwise and attached to the pulleys by means of set screws. The whole is then skimmed up in a lathe, and it will be found that this makes quite a nice light overhead drum, which gives nearly three feet of travel over the grinding wheel. The small pulley is so arranged that it may be driven off the existing cone pulley on the overhead shaft which drives the lathe. By this means a good increase of velocity is given by the emery wheel.

The cut is put on by means of a cross fed screw in the lathe saddle. If a taper movement is required the top rest is of course set to taper just as if one were going to machine taper in the ordinary way. The maker of the attachment states that he considers the rig simple; that it will provide accuracy in grinding, and can be fitted by any average machinist.

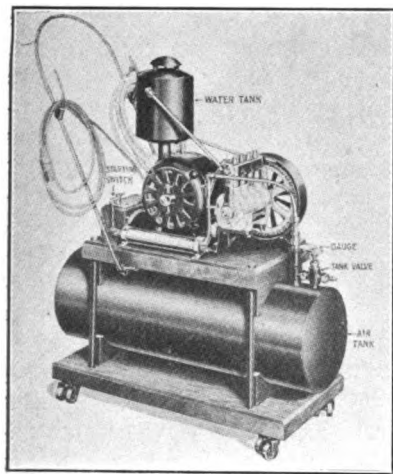
### DRILLING HOLES IN GLASS.

Holes of any desired size may be drilled in glass by the following method: Take a small three-cornered file and grind the points from one corner and the bias from the other and set it in a brace, such as employed in boring wood, etc. Lay the glass in which the holes are to be bored on a smooth surface covered with a blanket or some other similar material, and begin to bore the hole. When a slight impression is made on the glass, place a disc of putty around it and fill with turpentine to prevent heating by friction. Continue boring the hole, but do not press too hard on the brace when drilling.



## GARAGE AND REPAIR SHOP EQUIPMENT.

**T**HE Kellogg Manufacturing Company, Rochester, N. Y., maker of the Kellogg four-cylinder air pumps, is marketing the Kellogg



**Kellogg Electric Motor Driven Garage Pump.**

electric motor driven garage pump shown in an accompanying illustration. As will be noted, the pump, electric motor and storage tank are mounted as a unit.

The pump is a heavy duty, water jacketed four-cylinder unit, powerful and compact, and may be connected direct to

the tire or to the tank, where air can be stored at a pressure of 150 to 200 pounds a square inch. A water tank is provided, the fluid circulating around the head of the cylinders of the pump, thence to the reservoir on the thermo-syphon principle. The bearings of the pump are of babbitt and the connecting rods of bronze. The pistons are of anti-friction metal, made leak proof by the company's exclusive cup washer construction. The cams are drop forged steel, carefully ground to size. Lubrication is by splash.

The electric motor is .25 horsepower capacity and drive is by silent chain. A knife switch regulates the operation of the motor, and connected with this is a simple automatic air release, which permits the motor to attain full speed before receiving the full load. The maker states that this eliminates fuse troubles.

Two gauges are provided. One, conveniently located, indicates the exact air pressure in the storage tank, which is tested under 500 pounds pressure to the square inch, and the other is incorporated in the tire line.

The platform on which the equipment is mounted is fitted with rollers, permitting it to be moved about the garage or to the sidewalk when a tire is to be inflated with air stored in the tank. As previously mentioned, shoes may be inflated from the pump direct if desired.

The motors are supplied for either alternating

or direct current, and when the former is to be used it is essential to state the number of cycles. In considering the installation of the equipment the maker states that it is important that the voltage be known and that the motor must receive its full number of volts if efficiency is desired. The Kellogg equipment comes complete or without the tank. The Kellogg Manufacturing Company will supply complete details on request.

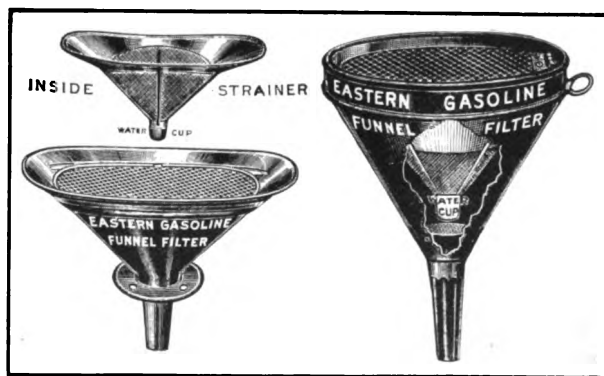
### ALUMALUX.

The Alunalux Company, Sidney, O., is marketing Alunalux, a solder especially compounded to unite aluminum with aluminum without the aid of a blow torch.

### EASTERN GASOLINE FUNNEL FILTER.

The Eastern Oil Tank Company, 146 Fletcher street, Lowell, Mass., is manufacturing the Eastern gasoline funnel filter, a part sectional view of which is shown herewith, also the inside strainer. The maker states that the design is very efficient in separating water and other foreign substances from the fuel and that its construction permits of easy disassembly and replacement.

As will be noted by the illustration the gasoline is filtered through a mesh and an inside strainer is included, the latter catching all water. The maker states that the funnel can be used in rainy weather without any water reaching the tank and that splashing of fuel is prevented. The



**Eastern Gasoline Funnel Filter for Separating Water and Other Foreign Substances from the Fuel.**

funnel filter is made to be carried easily in the car, assuring the use of clean fuel when purchased on the road, etc.



## EISNER-LENK COMPANY EXPANDING.

**T**HAT a successful business can be built up by prompt service, careful attention to details and fair dealings is demonstrated by the con-

engineering experience Mr. Eisner founded the present concern, which has received the indorsement of the Eisemann Magneto Company, which appointed the Eisner-Lenk Company its New England official repair and service depot. In addition the Boston concern represents Marburg Bros., importer of the Mea magneto; the Simms Magneto Company, the Gilbert Manufacturing Company and the Geiszler Bros. Storage Battery Company. The Eisner-Lenk Company is also agent for a number of manufacturers.

The company is particularly well equipped to give prompt and economical service to its patrons, as it not only carries in stock the numerous parts of magnetos, coils, etc., but has an extensive laboratory fitted with machinery and special apparatus for repairing and testing. Much

of the equipment utilized in this work is the design of Mr. Eisner and has made possible the easy location of troubles requiring considerable time by the usual methods.

The business end of the company is looked after by Oscar C. Lenk, treasurer, who is well qualified for the position, having formerly been connected with the Boston Plate & Window

stantly increasing number of patrons of the Eisner-Lenk Company, the ignition and electrical specialist, located at 1074 Boylston street, Boston. Although primarily a New England concern, it has obtained an enviable reputation among owners and the trade throughout the East by solving and correcting puzzling ignition troubles, as well as all electrical difficulties.

The corps of electrical experts is headed by Harry Eisner, the president of the concern, who has been identified with the automobile industry since the first application of electricity to the internal combustion engine. He learned his trade as an electrician in Vienna, Austria, and with that thoroughness required of experts abroad. His experience with foreign magnetos and ignition systems proved invaluable in this country, where he has been identified with the Albert Champion Company, one time maker of magnetos, coils and electrical devices.

After years of practical and



**Section of General Office of Eisner-Lenk Company, Ignition and Electrical Specialist of Boston—The Company Is Opening Branches in Leading Cities of New England.**



**The Laboratory of the Eisner-Lenk Company Is Equipped with Special Machinery and Apparatus for Locating, Correcting and Repairing Electrical Equipment.**



Glass Company as office manager. He was also co-partner in a large agricultural proposition in which he disposed of his interests to become identified with the Eisner-Lenk Company.

The growing demand for the services of electrical experts in connection with the equipment of the modern automobile has led the Boston company to open branch agencies, and these will be established in all of the principal cities in New England as soon as thoroughly experienced and competent men can be secured to handle the business.

### **METZ SPEEDSTER.**

#### **Company Announces New Model of Racy Lines, Nicely Finished and Appointed.**

The Metz Company, Waltham, Mass., maker of the well known Metz friction drive car, has brought out a new model termed the Speedster, which is shown in an accompanying illustration. It was designed for those who desire a departure from conventional body lines and is very attractive and racy in appearance, the seats being low and set at a comfortable angle, as is the steering column. Another distinctive feature is a 23-gallon oval fuel tank placed at the rear of the seats and provided with a large nickel plated filler cap. All parts are nickelled, these including the steering column, centre control shifting lever, pedals, radiator cap and binding of the floor and running boards. An innovation is the locating of the electric headlights in the front fenders.

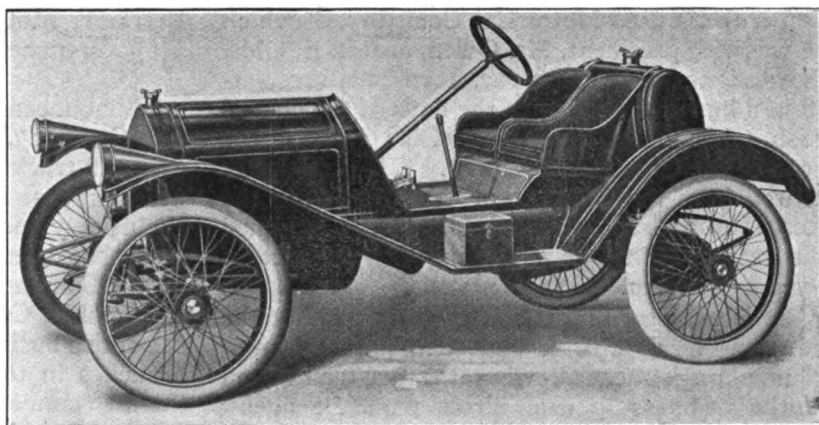
The chassis carries a four-cylinder motor, with the cylinders cast en bloc, rated at 22.5 horsepower. Ignition is by a Bosch true high-tension magneto, carburetion by a float feed automatic type and cooling by thermo-syphon. The lubrication system is of the constant level splash type, the oil being circulated by a gear pump. Friction drive, 90-inch wheelbase, wire wheels, two sets of brakes, left hand drive and centre control are among the features of the model.

The equipment is very complete and the speedster is held to be capable of making from five to 55 miles an hour on the high speed. Economy of fuel and minimum cost of maintenance are qualities emphasized in the Metz product.

### **NON-FLUID OIL.**

#### **Maker Is Calling Special Attention to Its Sprocket Wheel Trade Mark.**

It is maintained by the New York & New Jersey Lubricant Company, New York City, that in the mind of nearly every motorist Non-Fluid oil is accepted as the refinement of the common lubricant known as grease and that it is not without a certain amount of pride that most men insist upon the former when in need of this form of lubricant. It is added, however, that what many motorists do not realize is that the excellent reputation which has been established for Non-Fluid oil was not built up by a class of lubricants known as non-fluid oils. On the contrary this reputation is held to have sprung from the exceptional qualities of a specific lubricant which bore the trade marked name Non-Fluid oil



**New and Attractive Metz Speedster, Built on Racy Lines and with Electric Lights Set into Front Fenders.**

long before such designation had ever been wrongfully applied to other lubricants.

This particular lubricant is the product of the New York & New Jersey Lubricant Company, which urgently invites the trade, as well as owners, to view its exhibit at the forthcoming New York show, in order that they become thoroughly familiar with this product. The company intends to call special attention to its sprocket wheel trade mark and to warn the public against the purchase of Non-Fluid oil in any package except the distinctive orange colored cans which bear this trade mark and the name of the sole manufacturer. It may be added that an interesting proposal has been prepared for the dealer, to induce him to discriminate during the 1914 season when purchasing Non-Fluid oil and offering it for sale, and this will be explained fully at the New York Show.



## GENERAL NEWS OF THE INDUSTRY.

### Reo Motor Car Company Will Market Its Product Direct—Peerless Concern Makes Decided Change in Its Sales Policy—C. P. Henderson Becomes Regal Official.

**A**NNOUNCEMENT is made that the Reo Motor Car Company, Lansing, Mich., will market the Reo car direct in the future, the selling arrangement with R. M. Owen & Co., New York City, having been discontinued. It is explained, however, that the change is not quite as radical as might be assumed from the foregoing statement, inasmuch as it is added that the entire sales organization of the Owen concern is to be taken over by the Reo company and continued in charge of R. C. Rueschaw as head of the sales department.

In connection with the above report, it is added that R. M. Owen has severed his connection with the Reo Motor Car Company, of which he was vice president. Mr. Owen, and R. E. Olds, the designer of the Reo car, have been associated in a business way since the days of the curved dash Oldsmobile, when Mr. Olds was at the head of the Olds Motor Works. When the latter retired from the Olds Motor Works to form the Reo Motor Car Company, Mr. Owen assumed the responsibility of marketing the product of the new concern.

It is explained by the Reo company that the purpose of this change is to eliminate the middleman or jobber, allowing the producing end of the business to deal direct with the agent, thereby developing to the utmost the efficiency of the organization as a whole and permitting increased value to the customer. It is further stated that the change has been contemplated for some time.

#### SECURES BIG CONTRACT.

#### Continental Motor Manufacturing Company to Produce 10,000 Saxon Engines.

The Continental Motor Manufacturing Company of Detroit and Muskegon, Mich., announces that it has been awarded the contract to produce 10,000 small four-cylinder motors for the Saxon Motor Company, Detroit, the organization of which to produce a light car was announced recently. These engines will be manufactured in the Muskegon plant, which is particularly well adapted for handling four-cylinder motors in large quantities.

The new motor is of the water-cooled type, with bore of 2.625 inches and stroke of four, giving an S. A. E. rating of 11 horsepower, although it will develop 14.7 horsepower on brake test at 2000 revolutions a minute. This will give a ratio of approximately one horsepower to each 50 pounds, as against a minimum of one horsepower to 75 for the larger cars. All material and workmanship entering into its manufacture will be strictly up to the Continental standard in every respect.

#### CHANGES SELLING PLANS.

#### Peerless Motor Car Company Disposes of Branches in New York and Chicago.

Announcement is made by the Peerless Motor Car Company, Cleveland, O., maker of Peerless cars and trucks, that, in order to reduce the overhead expense incident to using a large building exclusively for the sale of one car, an arrangement has been made whereby the C. T. Silver Motor Company in New York and the McDuffee Automobile Company in Chicago will take over the entire business and equipment of the Peerless branches in those cities. It is understood that the men connected with the branches in each city will become identified with the new agencies. E. J. Kulas, general manager of sales for the Peerless company, makes the following explanation:

It is our aim in taking this step to readjust the proportions between selling and manufacturing expense in Peerless cars. We have found that selling expense generally in the high grade motor car business has been too high. And so far as the Peerless Motor Car Company is concerned we are going to correct that condition if we can.

Because of its high quality and necessarily high price the sales of Peerless cars are naturally somewhat limited. When the cost of operating and maintaining a large sales and service building in a desirable location falls only on those sales it is a very considerable item. But if many other cars are sold with the same equipment, the overhead cost is much reduced.

This new arrangement will enable the buyer to select from a larger stock of automobiles the one most desirable for his purpose, as each of these companies will carry in stock gasoline cars of lower price, and the Chicago house also has a line of electrics. It is well known that the dealer's margin of profit on automobiles is lower than would be considered fair in any other retail business.

Conditions have changed in the motor car business. The big demand has been supplied and it now becomes necessary for the dealer and manufacturer to meet these changes in conditions. The plan adopted by the Peerless Motor Car Company is a step in the right direction and will be copied by others.



A reduction in price is not thought of. In fact, it is entirely impossible. The Peerless car is the most expensive to build of any manufactured either in America or Europe. It includes costly features of design adopted to secure maximum efficiency without regard to price.

During the past few years the Peerless company has been developing, through researches in its metallurgical laboratories and advanced heat treating processes, a line of motor car steels which it uses exclusively and which in strength and wearing quality are far superior to any previously known in the industry. Those steels have greatly increased the life of the Peerless car, but they have also increased the cost of production. This year, manufacturing cost has been increased further by the addition of nearly \$400 worth of equipment.

This steadily mounting manufacturing cost has made necessary a reduction in expense somewhere. And it seemed to us that the selling overhead, which in no way affects the satisfaction of the purchaser in his car, was the place to make it.

### SILENT AMERICAN MOTOR.

**Company Bearing That Name Is Organized in Toledo for Experimental Work.**

A number of men prominent in the automobile industry in Toledo, O., have organized the Silent American Motor Company, with initial capital of \$10,000. Among those interested are the following: President, Charles Turner of the Morton Truck Company; vice president, Thomas J. Kehoe, Kinsey Manufacturing Company; secretary, J. R. Ford, Ford Realty Company; treasurer, J. W. Hawk, Kinsey Manufacturing Company; general manager, S. F. Sawyer; directors, the above and S. L. Kelly, Electric Auto-Lite Company, and B. C. Gamble, Gamble Motor Car Company.

It is understood that the original capital will supply the necessary finances for experimental work on a new type of patented noiseless automobile engine. If these tests should bear out the claims of the inventor, as is expected, the capital will be increased to \$300,000.

### EMPLOYEES SHARE IN PROFITS.

**King Motor Car Company Makes Christmas Presents Equal to One-Tenth of Salary.**

Employees of the King Motor Car Company, Detroit, maker of the King car, were very pleasantly surprised Dec. 20, when each received, as a Christmas present, a check amounting to one-tenth of his salary as his share of this year's profits. This gift was in fulfillment of the policy adopted by the officers and stockholders, who believe that all those engaged in the production of King cars should share in its success.

At noon, the employees were assembled in one of the large rooms of the factory, where one of the officers made the presentation, announcing

that the company had passed through an unusually successful year and was now shipping 10 cars a day. The rapid development of the business was one of the surprises of the year. After the checks had been distributed a lunch was served to all.

### HENDERSON WITH REGAL CAR.

**One of the Indianapolis Brothers Becomes Vice President—Haines Is President.**

Unusual interest attaches to the announcement that Charles P. Henderson of Indianapolis has been elected vice president of the Regal Motor Car Company of Detroit. The other officers of the company are: President, Fred W. Haines; secretary and treasurer, Harold H. Emmons, and sales manager, F. L. Pierce.

Mr. Henderson's election followed closely



The Hendersons of Indianapolis: C. P. at the Left; R. P. at the Right.

upon his taking charge of the sales and advertising for the Regal company, Dec. 1, and has created some surprise because of his connection with the Henderson Motor Car Company of Indianapolis. It is understood, however, that he will retain his financial interest in the latter concern, although leaving the active management to his brother, R. P. Henderson.

### ADDS CARTER CARBURETOR.

**H. W. Johns-Manville Company Will Act as Its Selling Agent in the Future.**

The Carter Carburetor Company, St. Louis, Mo., maker of the Carter multiple-jet carburetor, announces that it has entered into an agreement with the H. W. Johns-Manville Company, New York City, whereby the latter concern acquires the exclusive sale of all models of this product.



Vice President Hugh H. C. Weed of the Carter company has become manager of the carburetor department of the New York concern.

The many branches of the H. W. Johns-Manville Company throughout the country afford it an exceptional opportunity to represent the manufacturer in this manner, and the Carter carburetor is still another addition to the long list of automobile accessories, the sale of which it has acquired during the past few weeks.

### FORD'S ANNUAL REPORT.

#### Officials of the Company Make Public Statement of Financial Condition.

The Ford Motor Company, Detroit, Mich., maker of Ford cars, has made public its annual statement of its financial condition at the close of the fiscal year, Sept. 30, as follows:

|                                  | Assets       | 1913         | 1912         |
|----------------------------------|--------------|--------------|--------------|
| Real estate and machinery.....   |              | \$10,669,968 | \$5,815,787  |
| Merchandise .....                |              | 9,183,370    | 6,387,541    |
| Cash and debts receivable.....   |              | 15,180,581   | 8,226,842    |
| Total.....                       |              | \$35,033,919 | \$20,430,171 |
|                                  | Liabilities. |              |              |
| Capital stock .....              |              | \$2,000,000  | \$2,000,000  |
| Accounts payable .....           |              | 4,774,746    | 2,136,507    |
| Floating debt .....              |              |              | 1,426,297    |
| Surplus and profit and loss..... |              | 28,259,173   |              |
| Surplus .....                    |              |              | 14,867,366   |
| Total.....                       |              | \$35,033,919 | \$20,430,171 |

It also is reported from Detroit that the Ford Motor Company has adopted a new method of paying creditors, depositing the amount due them to their credit in one of the Detroit banks, instead of drawing checks for such amounts as in the past.

### R-C-H BID IS CONFIRMED.

#### Reported That Business Will Finally Be Disposed of as a Going Concern.

At a hearing Dec. 20, Lee Joslyn, referee in bankruptcy, confirmed the guaranteed bid of \$295,000, made by the Todd-Frank-Friedeberg Company, for the assets of the R-C-H Corporation of Detroit. Creditors presented an offer for \$300,000, but the referee explained that the increase was not sufficient to warrant his reopening the bids.

It is understood that an attempt will be made to dispose of the plant as a going concern, and that the company may be reorganized. It is the intention of the purchaser to utilize all the parts now in stock for the production of cars, during

which time an effort will be made to interest eastern capital. Through these methods, and by the liquidation of the real estate, it is expected that a substantial sum will be netted for the creditors.

### WAVERLEY HAD GOOD YEAR.

#### Annual Report Shows Surplus and Undivided Profits Aggregating \$950,000.

The report of the Waverley Company, Indianapolis, Ind., maker of Waverley electric cars and trucks, issued to the stockholders, shows that the business for the past year has been very satisfying. The gross business for the year was \$1,312,815.94 on a capitalization of \$190,000. The surplus and undivided profits for the period amounted to \$950,000.

The officers and directors elected at the annual meeting are: President, William B. Cooley; vice president, Herbert H. Rice; secretary, Wilbur C. Johnson; treasurer, William Kothe; directors, Hugh Daugherty, Joseph C. Schaf, Alexander C. Ayres, Hugh M. Love.

### REMOVES TO DOWNINGTOWN.

#### Rowe Motor Manufacturing Company Leaves Its Rented Building in Coatesville, Penn.

The Rowe Motor Manufacturing Company, formerly of Coatesville, Penn., has removed to Downingtown, same state, where it has purchased 14 acres of land and buildings, which are being improved to meet the requirements of the company. The concern manufactures Rowe motor trucks, and has been occupying rented quarters in Coatesville for some little time.

President Samuel J. Rowe states that the plant will be first class and thoroughly modern in every respect, and that the location is far superior to the old one for handling the rapidly increasing business of the company.

### SHOWS LARGE PROFITS.

#### Statement of United States Rubber Company to Stock Exchange Committee.

In its statement to the listing committee of the New York Stock Exchange, when making application for the listing of its new \$9,422,000 eight per cent. non-accumulative first preferred stock, the United States Rubber Company gives the following consolidated balance sheet for the period ending June 30, 1913, partly estimated for



three months, except as to companies whose fiscal year ended Dec. 31, 1912, and whose statement is for six months:

Operating profits, \$6,105,600; other income, net, \$412,347; total income, \$6,517,948; insurance, freight, selling, general expenses and taxes, \$2,363,892; balance, \$4,154,056; interest, \$1,076,194; surplus, \$3,077,861; dividends, \$1,775,014; surplus for periods as above, \$1,302,847.

The surplus on March 31, 1913, as per United States Rubber Company's report, \$16,735,736. Adjustments of surplus in order to bring statements of all above companies to end June 30, and covering dividends received from said companies during quarter ending March 31, \$1,764,098. Surplus June 30, 1913, \$16,274,486. Estimated earnings in excess of dividends for quarter ending Sept. 30, 1913, \$597,954.

### STUDEBAKER HEAD RETIRES.

**Clarence H. Booth Resigns as General Manager of Studebaker Corporation.**

Frederick S. Fish, president of the Studebaker Corporation, Detroit and South Bend, Ind., announces the retirement of Clarence H. Booth, who was general manager of the automobile division of that concern. It is understood that Mr. Booth will leave early in the new year for an extended trip abroad, after which he will devote his time to other interests. The bulletin making the above announcement reads as follows:

It is with regret that we announce the resignation of Clarence H. Booth, general manager of the automobile division of the Studebaker Corporation, to take effect Jan. 1, 1914. Mr. Booth was under contract for a term of years, but in order to carry out plans of his own he has been released at his own request. Mr. Booth carries with him the best wishes of the management for his future success in the undertakings he has in contemplation.

### WITH MOLINE COMPANY.

**Well Known British Knight Engine Expert Becomes Chief Inspector.**

President W. H. Van Dervoort of the Moline Automobile Company, East Moline, Ill., announces the appointment of A. F. Marshall of Coventry, England, as chief inspector for the production of the new 50 horsepower Moline-Knight motor, with which this line will be equipped in the future. He is well known in Great Britain, where he has been identified with the motor car industry since its inception. For the past 10 years he has been associated with the English Daimler company.

Mr. Marshall is thoroughly familiar with every detail of the Knight motor. He represented the Daimler concern during the Daimler-Knight motor test conducted by the Royal Automobile Club of Great Britain, in 1911. Before Moline-

Knight engines are placed in the chassis each one will be personally inspected and passed by the new expert.

### POPE PROPERTY IS APPRAISED.

**Report Filed with Connecticut Superior Court Shows Assets of \$2,034,899.90.**

The appraisers appointed to inventory the property of the Pope Manufacturing Company, Hartford, Conn., now in the hands of Col. George Pope, as receiver, have filed their report with the clerk of the superior court for Hartford county. It is explained that the inventory on raw materials and supplies, finished parts, etc., was cut exactly in half, while, with respect to the accounts receivable, it is explained that there are on the books 797 outstanding claims, aggregating \$224,519, but as some are old and doubtful, these have been deducted. The appraisal follows:

|  |                       |
|--|-----------------------|
| Land on Capitol avenue.....            | \$84,750.00           |
| Buildings on this property .....       | 634,375.00            |
| West works lot .....                   | 47,200.00             |
| Buildings on this property.....        | 62,800.00             |
| Equipment at main plant.....           | 107,000.00            |
| Machinery for manufacturing .....      | 369,877.71            |
| Standard small tools .....             | 46,822.00             |
| Patterns for automobile parts.....     | 2,600.00              |
| Main office furniture, etc.....        | 3,500.00              |
| Equipment of West works .....          | 14,875.50             |
| Machinery, tools, etc.....             | 11,795.50             |
| Fifty-five second hand cars.....       | 40,000.00             |
| Forty-three cars in process.....       | 81,300.00             |
| Raw material, finished parts, etc..... | 331,542.85            |
| Accounts collectible .....             | 181,461.34            |
| <b>Total.....</b>                      | <b>\$2,034,899.90</b> |

Francis R. Hoyt, Cleveland, O., consulting engineer, has removed his offices from that city to Staunton, Va., in order to be in intimate touch with the early production of the Falcon cyclecar, of which he is designer. The Falcon Cyclecar Company is now erecting machinery in its new plant at Staunton and expects to be under quantity production by Feb. 15.

Additional licensees under the so-called Canfield spark plug patent, which is held by A. R. Mosler & Co., Mount Vernon, N. Y., are announced by that concern as follows: Splitdorf Electrical Company, Newark, N. J.; Standard Company, Torrington, Conn.; Bosch Magneto Company, New York City, and Auburn Ignition Company, Auburn, N. Y.

H. T. Gardner is manager of the annual show of the Syracuse Automobile Dealers' Association, which will be held in the state armory, Syracuse, N. Y., Feb. 24-28.

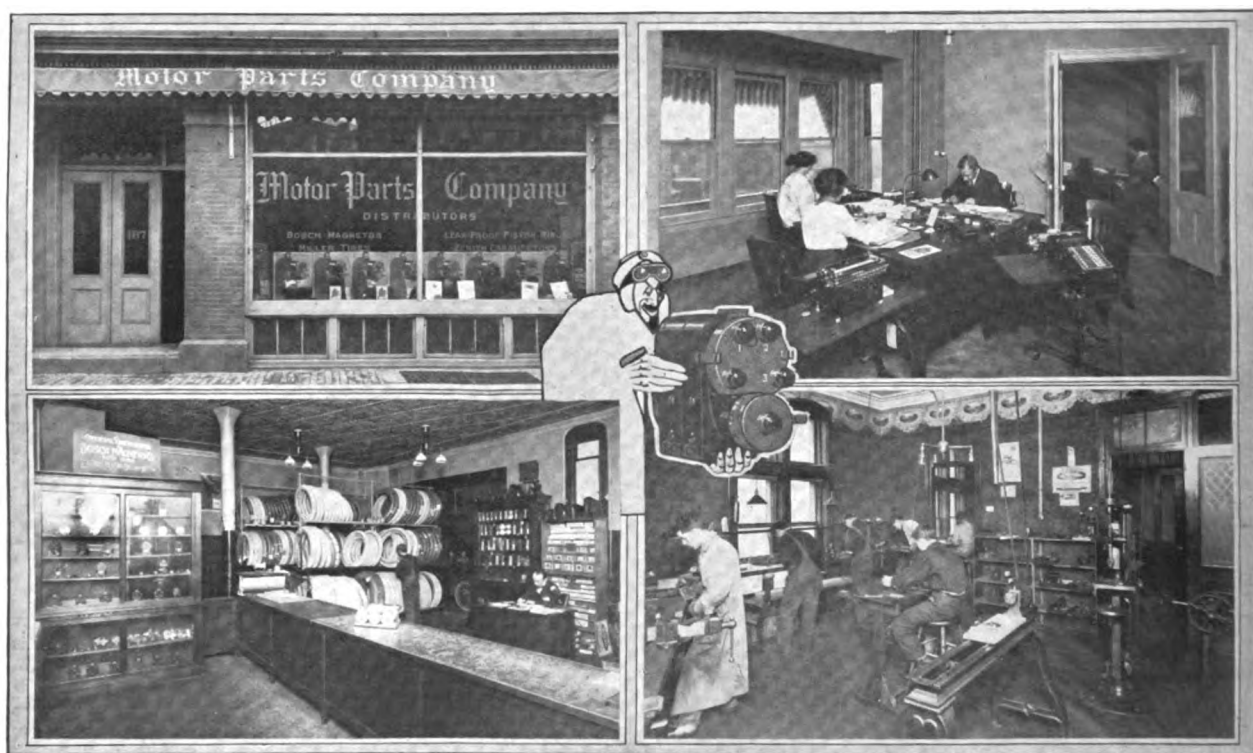


## GROWTH OF MOTOR PARTS COMPANY.

THE remarkable opportunities for successful business in Boston and New England are particularly well exemplified by the history of the Motor Parts Company, which took over the distribution of Bosch magnetos and plugs in that territory about a year ago. The concern was well established in Philadelphia, where it had been engaged in supplying the trade with these and other products, but was wholly unknown in the new field. And while it attributes an important portion of its success to the fact that its name was linked with that of the Bosch Mag-

neto in January, but March 1 saw the company without its machinery and equipment. This did not deter Mr. Wilkenning from pursuing his well designed plan for becoming acquainted. Well stocked displays at the Boston motor boat show in February and the Boston automobile show in March aided very materially in bringing the advantages of dealing with this company to the attention both of the trade and the owners.

The growth of the business since March 1 has been somewhat phenomenal. Not only has it been found necessary to establish eight supply



**Illustrating Some of the Departments of the Boston Branch of the Motor Parts Company, Distributor for Bosch Products, Leak Proof Piston Rings, Zenith Carburetors, Mohawk Tires, Etc.**

neto Company, it is now also well known throughout New England as factory representative for a number of other lines, included among which may be mentioned the Leak Proof piston rings, Zenith carburetors, Mohawk non-skid tires, etc.

Under the management of F. W. Wilkenning, the concern leased quarters at 185-187 Columbus avenue in December, 1912, and at once began a carefully arranged campaign of publicity, in which announcement cards were mailed to the trade, these being followed by personal calls. The building was to have been ready for occupancy

stations in various sections of the territory, but a well stocked branch was located in Springfield, at 143 Chestnut street, early in the summer.

Insofar as the Boston house is concerned, the departments of the company are conducted systematically, the details being looked after very carefully. The entrance is at 187 Columbus avenue and a large portion of the ground floor is devoted to the Bosch laboratory. There are two laboratories and a large number of expert mechanics and electricians are employed in the overhauling work and remedying of magneto troubles, many of which are the result of too



much inquisitiveness on the part of motorists who experiment unwisely with the instruments. The machinery equipment is most complete and the workmen are at all times away from outside influences.

While the work incidental to the distribution of Bosch products and satisfying owners of such equipment is considerable, it will be noted by the accompanying illustration that other details of the business are such as to require much time and attention. The extent of the tire department

is indicated by the photograph, which also shows the method of displaying Bosch magnetos and other products.

The general offices are large, light and well ventilated. In these, a large corps of employees is kept busy caring for the constantly increasing volume of correspondence with all sections of New England. This, in itself, is an important commentary on the possibilities of this section of the country with reference to the automobile industry and its other allied interests.

## LEECE-NEVILLE FORD MOTOR-GENERATOR.

**T**HE Leece-Neville Company, Cleveland, O., maker of electric dynamos and motors for automobile lighting and starting, has brought out a system for the model T Ford car, which has been subjected to severe road tests before being announced. It is a unit system, that is, the generator and motor are combined, and the same attention has been given to details as with the equipment manufactured by this concern for larger machines. The Leece-Neville system is standard equipment on several well known makes.

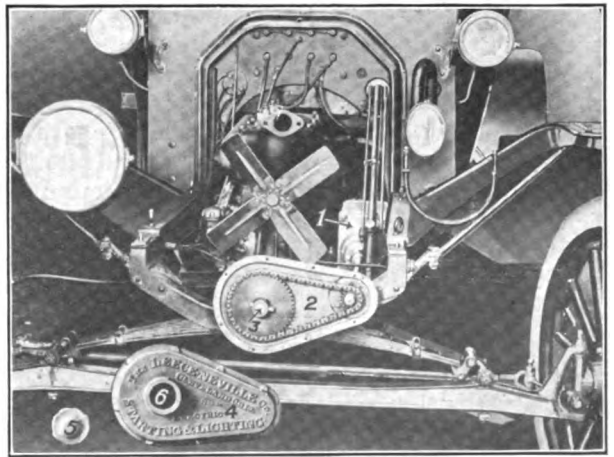
An accompanying illustration shows the Ford system installed and with its components numbered. The motor-generator 1 is mounted in a cradle under the steering column between the crankcase of the engine and the body frame. The cradle is retained securely by bolts, these being fastened to the crankcase and frame, and the installation does not require any fittings or alterations, as the old holes are utilized. New and longer bolts are provided, however, as they are employed to retain the cradle.

The chain case 2 is mounted on the front cross frame member by displacing the front end bearing of the engine, the case being provided with a bearing. The old bolts are used to retain the new bearing cap and case to the cross member. The shaft 3 extends through the hole from which the starting crank has been removed and is coupled direct to the engine shaft. The shaft from the motor-generator runs under the radiator and above the front cross frame member, and to this shaft is keyed a small sprocket. The large or driving sprocket is also keyed to the shaft 3.

Drive is by a one-inch silent chain which operates in lubricant, insuring quietness, the mechanism being protected by the chain case cover 4, which has a hole 6 to which is fitted the screw cap 5. The mounting is not only neat and

the equipment easily installed, but all components of the system are accessible.

The motor starter is operated by simply pushing a button, it cranking the engine at a speed of 150 revolutions a minute. Upon the engine starting the motor functions as a dynamo, supplying energy for lighting and charges a storage battery. The designer of the system states that the starter is so constructed that the car motor cannot stall at any speed, as the electric motor has sufficient output to propel the car on the high speed.



**Leece-Neville Ford Light and Motor Starting System.**  
a Motor-Generator Employing a Silent Chain Enclosed in a Casing.

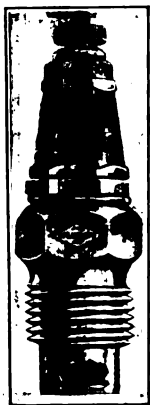
All lamps are lighted by electricity from the battery, which is kept in a properly charged condition by the dynamo, assuring a steady light irrespective of whether the car is inoperative or travelling at high speeds. The motor-generator weighs 47 pounds, the battery 70 and the fittings about 15. All parts are supplied complete and so arranged as to make installing an easy matter. All wires come cut to the proper length. The accessories are strictly high grade.



### NEW FORD PLUG.

#### Splitdorf Electric Company Brings Out Special Type for Model T Motor.

The Splitdorf Electrical Company, Newark, N. J., which is marketing a true high-tension magneto for the model T Ford motor, has brought out a spark plug designed especially for this engine, which is shown in an accompanying illustration. It is constructed to withstand the burning effect of magneto currents and high voltages of induction coils, the electrodes being constructed of a heat resisting material.



Splitdorf  
Ford Mag-  
neto Plug.

The plug embodies the same principles as the Common Sense plug made by this concern, the centre electrode being protected by a lateral winding of white India mica over which is a protector of special porcelain. The last named is hexagon shaped.

Gas tight features are obtained by the use of a copper and asbestos gasket and a vulca-bastian gasket. The sparking points are extra heavy, and one of the qualities emphasized in the design is that the gap is not increased by the intense heat of the magneto spark.

The plug is provided with proper length of barrel and the sparking points so project into the combustion chamber as to obtain maximum efficiency from the mixture, a quality making for economy of fuel as well as eliminating the usual spark plug troubles.

### EDISON BATTERY DISPLAY.

#### Special Attention Will Be Drawn to the New A-5 Type for Vehicle Service.

The Edison Storage Battery Company, Orange, N. J., will exhibit the Edison alkaline nickel-iron storage battery for ignition, lighting and traction, at the forthcoming New York show. During the past year a new size has been added to the line of vehicle batteries, to which special attention will be drawn. This is known as the A-5, having a rated capacity of 187.5 ampere-hours. It is intermediate between the A-4 (150 ampere-hours) and the A-6 (225 ampere-hours), and is used in passenger vehicles, in 1000-pound delivery wagons, in baggage, freight and industrial trucks and for other services where the A-6

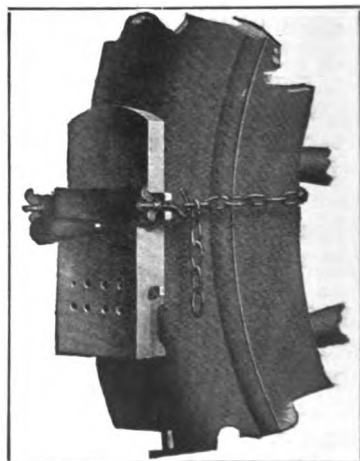
would be more than ample. Batteries for ignition and lighting of gasoline cars will be shown in two capacities, 40 and 80 ampere-hours. They are made up in 6.5-volt sets, assembled in steel boxes or wooden trays.

It is pointed out that Edison batteries are made today in practically the exact form that they were five years ago, and a peculiarity of the nickel-iron battery is that this same type is used for all services, stationary and traction. No compromises or modifications are held to be necessary to obtain the desired result in all classes of work, so that identically the same elements may be used in both light and heavy traction, or for the operation of lighting plants in country homes. All Edison equipments, therefore, are maintained to be uniformly reliable, and it is possible to include a complete assortment of the different sizes at the automobile shows.

### NEW WIZARD VULCANIZER.

#### National Motor Supply Company Marketing New Model of Portable Steam Vulcanizer.

The National Motor Supply Company, Cleveland, O., well known maker of vulcanizers, is manufacturing a new model known as the Wizard automatic steam vulcanizer. It has a hollow body partly filled with water and sealed at the factory. A fire box filled with asbestos packing is cast in the bottom of the vulcanizer, and upon pouring a predetermined amount of gasoline in the receptacle, the fuel is absorbed by the packing. When the fluid is ignited, it burns with a blue flame and no smoke, a series of draft holes being open to the firing chamber, as will be noted by an accompanying illustration which shows the Wizard attached to a casing. As the temperature is automatically controlled, the vulcanizer requires no attention after lighting, and it is stated that perfect vulcanization can be easily obtained in five minutes.



Wizard Steam Vulcanizer.

The Wizard has a vulcanizing face six inches long and three wide. It is curved to conform to a



casing against which it is clamped by an adjustable chain held by special retainers. When tubes are to be repaired a plate is employed. The Wizard permits of repairing shoes without removing them from the wheel. The entire equipment is nickel plated and highly polished and is very complete, including rubber, cement, shears, instructions, etc., packed in a neat wood box with slide cover. The Wizard is moderately priced.

### CONDITIONS IN INDIANAPOLIS.

#### Business Interests of the City Outline Industrial Situation as They See It.

Because of the importance of the automobile factories in Indianapolis, Ind., some little interest attaches to conditions arising from the recent strikes of street car employees and teamsters in that city. The business interests have prepared a statement for general circulation, in which these troubles have been reviewed at some length. The conclusions drawn from this statement are the following:

The effort to unionize the teamsters followed the street car trouble, and was looked upon by the business men as a part of a general programme of organized labor to make Indianapolis a closed shop city. The determined resistance of the business men first resulted in the resignation of Mayor S. L. Shank, after he had failed to control rioting at the time of the first strike. Harry R. Wallace, the city comptroller, automatically succeeded to the office and entered into the fullest co-operation with the business men's organization to the end that there was little disturbance in the streets when the teamsters' strike was called.

Through the initiative of the Employers' Association, practically all of the concerns in the city employing teamsters or drivers, were brought together in an organization known as the Commercial Vehicle Protective Association and a regular defensive campaign was inaugurated. On the first day no effort was made to move commercial vehicles, but the organization work was sufficiently completed the second day so that many trucks and drays were delivering goods. Some of these were escorted by policemen, but in the main they were guarded only by private employees with police powers.

The result of this co-operative programme between the city officials and the business interests was that within four days after the strike was declared traffic had been restored to nearly a normal basis. The union had been able to enlist but a comparatively small percentage of the teamsters, and the great majority of firms was ready to operate with their regular drivers as soon as protection was provided. While the strike has not been called off officially, all members of the union have been advised to seek work, the suggestion being made that they have verbal agreements with employers as to wages and that permission be obtained to wear the button. No pretense at a demand for general recognition of the union is now being made.

### PITTSBURG'S ANNUAL SHOW.

#### Space in Exposition Hall Already Has Been Taken for 72 Makes of Cars and Trucks.

It is maintained that the selection of the Exposition hall for the annual Pittsburg automobile

show, Feb. 14-21, will give general satisfaction because of its central location and accessibility both for out-of-town visitors and residents of the city. The display will be under the auspices of the Pittsburg Auto Show Association.

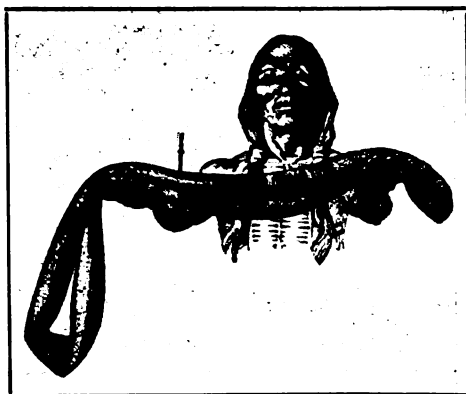
Already, space has been taken for the display of 72 makes of automobiles and business wagons, and it is expected that cyclecars will figure prominently among the exhibits, a special department having been set aside for them. The decorations will be somewhat more elaborate and pretentious than heretofore, it being stated that 10,000 feet of continuous paintings will screen the walls.

### INDIAN INNER TUBE.

#### B. F. Goodrich Company's New Product Recalls Sling Shot Days of Youth.

The B. F. Goodrich Company, Akron, O., maker of Goodrich tires, is placing a new inner tube in the market,

which is said to possess a number of distinctive features. It is termed the Indian, and it is explained that it



New Goodrich Indian Inner Tube.

gets this name from the fact that it is a reddish brown in color.

The new tube is slightly heavier than the gray tube made by this concern, and it is stated that, by reason of a new process in curing, it has sufficient tensile strength and elasticity to withstand the constant road jars. The maker claims that in matter of elasticity it will remind the motorist of the sling shot days of his boyhood, in that it appears to possess the ability to stretch unduly and still return to its original form.

The second annual Maritime motor show will be held in the new armory, St. John, N. B., under the auspices of the New Brunswick Automobile Association, Jan. 14-21. E. M. Wilcox of Toronto, who acted as manager last year, will have charge again this year. The show will attract patronage from New Brunswick, Nova Scotia and Prince Edward Island.



# IN THE REALM OF THE MOTORCYCLIST.

## Savannah's Christmas Day Grand Prize Race Postponed on Account of Rain--Plans for Display at New York Show--News of the Clubs and Manufacturers.

**B**ECAUSE of heavy rain, it was found necessary to postpone the running of the 300-mile Grand Prize race planned for Christmas Day under the auspices of the Savannah Motorcycle Club, Savannah, Ga. A later dispatch says the event was won by a Bosch equipped Excelsior machine. The entrants were:

C. H. Sudduth, J. M. Davis, E. G. Baker, L. G. Mene-witz, E. G. Steiner, Jr., H. F. Kuck, Jr., L. G. Buckner, H. C. Gould, W. D. Mott, B. Schrivalle, J. H. Kelly, Charles Balke, Paul Warner, J. U. Constant, T. E. Dedge, M. C. Gregory, R. E. Emmonds, Gray Sloop, Z. D. Kelly, Frank Hart, Harry Glenn, Indians; M. Gardner, C. F. Goudy, Robert Perry, M. Schroeder, J. E. Hodge, Clifford Walker, C. C. Adams, A. J. Chapple, A. A. Rahner, Excelsiors; J. Yerkes, J. S. Caslere, J. E. Mosher, J. W. Gregorie, George

man of the competition committee, and to receive no referee fee for services rendered, from the F. A. M."

In article 3, section 2, add: "An amateur may have his expenses paid by others than himself while attending and actually competing in national championship races".

In article 5, section 2, add: "Amateurs are prohibited from riding ported machines in any event except those of international competition".

In article 6, section 2, add: "In events characterized as sidecar races, machines having an engine not exceeding 61 cubic inches or 1000 cubic centimeters piston displacement may be used on half-mile dirt tracks".

In article 17, section 7, after the words "who have been injured while riding on motorcycle race tracks", insert the words "in a regularly sanctioned event".

### The New York Show.

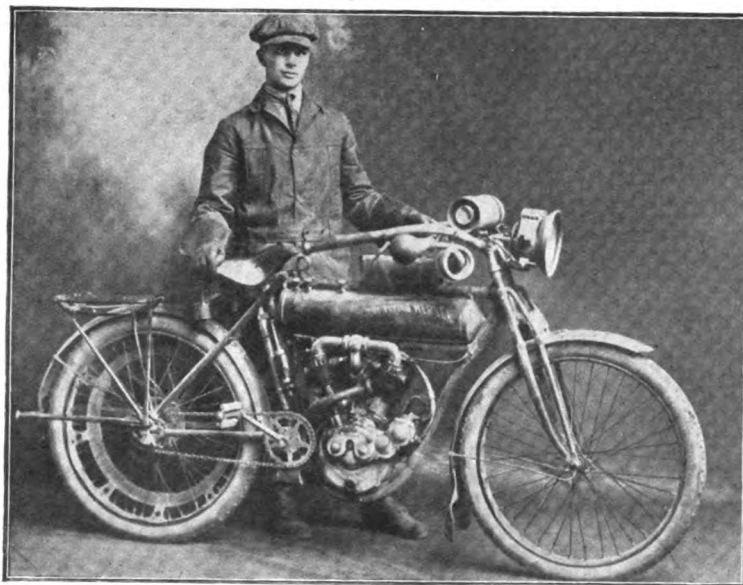
Elsewhere in this issue is presented a detailed list of the exhibitors at the forthcoming New York show, which is to be held in the Grand Central Palace, Jan. 3-10. Twelve makers of machines will be represented, and the accessory list includes a number of concerns which make a feature of motorcycle equipment. The two-wheel mounts will be displayed on the fourth floor, but the committee in charge has sought to arrange the exhibits of pleasure cars so as to attract visitors to each floor in turn, and by this plan it is expected that motorcycle makers will reap greater benefit than formerly has been true with reference to the New York show.

The makes of machines which will be seen at this display include: Flying Merkel, Thor, Yale, Dayton, Emblem, Excelsior, Harley-Davidson, Indian, Pope, R-S, Schickel and Henderson. All of these were shown at the Chicago show in November, and have been briefly described in these columns. Particular attention will be

drawn to self-starting features. The first machine to be fitted with a motor starter was the Flying Merkel, which announced a model thus equipped during the New York display a year ago. The success which has been met by this company as a result of the innovation apparently has had its influence upon other makers, who are announcing self-starting models this year.

### Good Service from Merkel.

Herewith is presented an illustration of Benjamin Finkbone of Middletown, O., who has been using a Flying Merkel motorcycle, made by the Miami Cycle & Manufacturing Company of that



**Benjamin Finkbone, Middletown, O., and Merkel He Has Ridden 8400 Miles at a Repair Expense of \$1.60.**

Sorenson, F. H. Camplejohn, G. J. Cleary, Thors; G. A. Porter, F. T. Laid, Yales; H. M. Gilbert, Crane-Atlanta, and three Merkel riders, names of which have not been announced.

### New Competition Rules.

The following changes in the competition rules of the Federation of American Motorcyclists, as voted by the competition committee at its recent meeting in Chicago, have been made public by the secretary:

In article 2, section 2, add: "Where meet is promoted by an affiliated club, whether the public is charged admission or not, the charge will be \$7 for each calendar day". Also add: "The charge for a sanction for a closed run, shall be \$2 per calendar day; the referee to be appointed by the club, subject to the approval of the chair-



city, during the past two years, to assist him in going to and from his work. He also has been on a number of long distance tours. All told he has ridden the machine 8460 miles and the total cost for repairs, etc., has been \$1.60.

#### Harris Oils for Motorcycles.

A number of prominent automobile racing drivers on the Pacific Coast have been using Harris oils, made by the A. W. Harris Oil Company, Providence, R. I., and of late several motorcycle riders of national reputation have adopted this product. Paul C. Derkum, known as "Dare-Devil" Derkum, won the recent San Diego-Phoenix motorcycle road race, using an Indian machine lubricated with Harris oil. He covered the 441 miles of desert route in 16:04:00, defeating his nearest rival by 3:29:00. At the conclusion of the race he wired the Harris company as follows:

The engine in my Indian, with which I won the San Diego-Phoenix race, was running perfectly at the finish, and sounded better than ever. It always has the kick when wanted and I give Harris oil the credit for this and for the fast time. You can say anything you want that is good about Harris oils and I will back it up, as I gave it the hardest test any oil has ever had in a long distance motorcycle race.

#### Bosch Sues Baker Company.

The court action, which was expected as the result of the recent notification of the Hendee Manufacturing Company and the Splittdorf Electrical Company, by the Bosch Magneto Company, New York City, alleging infringement of patent rights, took an unexpected turn earlier in the month, when the Bosch company filed suit against the F. A. Baker Company of New York City, distributor for Indian machines in that territory. The complaint alleges that in the defendant's establishment infringements have been committed through the selling of motorcycles embodying inventions belonging to the Bosch Magneto Company and that the defendant has infringed upon the letters patent No. 974,967, of which the Bosch Magneto Company is the exclusive owner, by making or causing to be made, using or causing to be used, and selling or causing to be sold, motorcycles embodying the inventions set forth in the claims of the Bosch patent, without consent of the plaintiff.

#### Jones Speedometer Reduced in Price.

The recent agreement between the Jones Speedometer Company and the H. W. Johns-Manville Company, both of New York City, has brought about a change in price for the Jones motorcycle speedometer, so that the rider is permitted to secure one for \$8 less than formerly. This instrument has a steady indicator hand,

large readable speed figures and is equipped with trip and season odometer.

To insure the motorcyclist the best possible service for every mile used, the H. W. Johns-Manville Company will equip all of its 49 branches as service stations, and will also establish other stations throughout the country. At each of these an expert mechanic, familiar with every detail of speedometer construction, will be on duty at all times, and a complete stock of repair parts will be ready for instant use.

#### Run on New Year's Day.

The Portland Motorcycle Club, Portland, Ore., is planning a 324-mile endurance run for Jan. 1. The event will be begun at midnight New Year's Eve and continue until 6 in the evening. This is the first time that a contest of this character has been held in that section during the winter, and considerable interest is being manifested in the outcome. The route will lie from Portland to Gresham and return. The following riders have entered:

Edward Barrett, Harley-Davidson; C. A. Hunt, Excelsior; H. E. Meeds, Thor; Harry Brandt, Thor; Carl Rose, Excelsior; D. Boone, Excelsior; Gus Peppell, Thor; A. Welch, Excelsior; B. Hadderly, Harley-Davidson; Peter Irvine, Dayton; A. Rife, Harley-Davidson; Vern Maskell, Indian; Victor Carlson, Harley-Davidson.



## FOR 1914

### MODELS AND PRICES

|   |          |
|---|----------|
| Model 440—4 H. P., Belt Drive, Single Cylinder,         | \$210.00 |
| Model 441—4 H. P., Chain Drive, Single Cylinder,        | 210.00   |
| Model 470—7 H. P., Belt Drive, Twin Cylinder,           | 225.00   |
| Model 471—7 H. P., Chain Drive, Twin Cylinder,          | 225.00   |
| Model 473—7 H. P., Self-Starting "Yellow Jacket" Model, | 290.00   |

IMMEDIATE DELIVERIES OF GENUINE  
GUARANTEED 1914 MODELS IN CAR-  
LOAD LOTS OR LESS.

*Wire For Territory Today*

**THE MIAMI CYCLE & MFG. CO.**

320 Hanover Street

MIDDLETOWN, OHIO, U. S. A.

New England Branch  
315 Dwight Street Springfield, Mass.



### First Motorcycle School.

In the Riverside motorcycle school, recently established by G. E. Woods at 533 West 110th street, New York City has the distinction of having the first institution of this character in the country. The course is composed of three lessons, each of which costs the pupil \$5. The first lesson includes how to ride, how to operate the magneto, carburetor and brakes, and how to oil, and an explanation of the driving regulations. The next teaches how to adjust and repair a carburetor, magneto, clutch, brakes, chains, pedals, valves, and care of same; putting on tires, repairing inner tubes and the general



**Flying Merkel's New England Branch at 315 Dwight Street, Springfield, Mass.**

care of a motorcycle. The third consists of instructions in taking down and overhauling a machine, removal of carbon from the cylinder, grinding valves, grinding in new pistons, putting in bushings, connecting rods, crankshafts, driving shafts, flywheels, etc.

### Trip Around the World.

F. J. Redman, Wichita, Kan., and J. B. Grosenbick, Denver, Col., are taking a motorcycle trip to San Francisco by way of Europe. They will first ride to San Antonio, Tex., and then follow the coast to New York, from which point they will sail for Europe. After touring

on the Continent they will return to America by way of the Pacific. They plan to reach San Francisco in time for the 1915 exposition.

### Stewart Motorcycle Speedometer.

The Stewart-Warner Speedometer Corporation, Chicago, Ill., states that motorcycle owners are showing a great deal of interest in the recent announcement of the Stewart motorcycle speed and mileage indicating instrument. This is a front drive motorcycle speedometer, in which it is claimed that the objectionable features of such mounting have been eliminated. The new instrument is meeting with pronounced success, according to the maker, and is being sold rapidly wherever the two-wheel mount is used.

### Merkel's New England Branch.

An accompanying illustration presents the New England wholesale branch recently opened at 315 Dwight street, Springfield, Mass., by the Miami Cycle & Manufacturing Company, Middletown, O., maker of Flying Merkel motorcycles. The branch is in charge of C. A. Van Doren, as manager, and his experience with this make of machine in this and other territories is such as to indicate that the business of the company will receive a decided impetus as the result of this latest move.

### In Postoffice Work.

The postoffice at Louisville, Ky., has purchased three motorcycles that will be used in the morning to deliver the mail to the carriers at the starting point of their routes. At other times they will be used in the collection of the mail. Some time ago the authorities tried the automobile for this service, but it has been decided that the motorcycle will be much more serviceable, especially in the congested districts.

The postmaster at Norfolk, Va., is trying out the motorcycle for collecting mail, to take the place of the horse and wagon. It is his belief that the machine can do the work of two horse drawn vehicles and save both time and money.

According to tests made in the postoffice at Omaha, Neb., it has been shown that parcel post packages can be delivered by motorcycles cheaper than by regular carriers. In the test 428 packages were delivered on the machines at a cost of \$10.80, or 2.5 cents a package, while five carriers delivered 657 packages at a cost of \$17.98, or 2.75 cents a package.

John F. Palmer, a postal messenger boy connected with the postoffice in New Haven, Conn., finds his motorcycle a big help in his work. He says that he can travel four times as far and deliver three times as many messages as with a bicycle. The purchase of this machine was an ex-



periment, which has resulted so satisfactorily that it is expected several others will be acquired in the near future. Palmer reports that he covers between 50 and 65 miles a day, and uses only one gallon of gasoline. He delivers about 125 messages each day, besides handling a number of emergency calls.

#### Rider as Life Saver.

Frank Emery, San Francisco, Cal., recently saved the life of Mrs. Marion Bennett of that city, through the aid of his motorcycle. Emery was riding in the vicinity when he learned of the serious condition of Mrs. Bennett, resulting from poisoning. He helped the stricken woman onto the front of his machine and rushed with her to the hospital, where the doctors were able to save her life.

#### Club Notes, Here and There.

The Fitchburg Motorcycle Club has been organized in Fitchburg, Mass., by a number of enthusiastic riders in that city, who expect to have a membership of 50 in a short time. The following officers have been elected: President, Thomas B. Matthews; vice president, W. K. Phillips; treasurer, M. J. Tapply; recording secretary, W. F. Bedard; financial secretary, George Dilley.

The New Britain Motorcycle Club, New Britain, Conn., is arranging for a bowling tournament during the winter season. Three teams have been selected thus far, these being captained as follows: Harleys, Richard Gustafson; Indians, Howard Bunce, and Excelsiors, Walter Faulk.

The Chicago Motorcycle Club, Chicago, Ill., has elected the following officers: President, Mark Gelder; vice president, F. E. Yates; treasurer, James Barry; secretary, C. J. Schipplock; financial secretary, A. J. Ensenbacher; captain, Edward La Vollette; lieutenant, P. Lobidan; sergeant-at-arms, O. Persons; directors, C. H. Lang and F. E. Wallace.

The Quaker City Motorcycle Club, Philadelphia, Penn., has chosen the following officers for the ensuing year: President, John H. Black; vice president, John O. Kelker; secretary-treasurer, William Thomson; captain, Marshall Sneyd; first lieutenant, Herbert Banner; second lieutenant, J. Kelker.

Daniel C. Joseph delivered an interesting talk on the early history of the self-propelled road vehicle, at the December meeting of the Maryland Motorcycle Club, Baltimore, Md.

The Fremont Motorcycle Club, Fremont, O., has elected the following officers: President, U. B. Lust; vice president, George Hefflinger; secretary-treasurer, Cyril C. Babione; captain, Urban Gompert; first lieutenant, Elton Barringer; second lieutenant, Lloyd Beck.

Earl Kenning of Hannibal, Kan., is trying to organize a club among the 10 riders in that city.

The Peoria Motorcycle Club has been organized in Peoria, Ill., with nearly 100 members. The following officers have been elected: President, John Bybee; vice president, William Herman; secretary-treasurer, J. A. Olsen; captain, Verne Runyon; trustees, Harold Luke, S. F. Weber, Edward Eaton; membership committee, Paul E. Gott, William Voss, Walter Ricker, C. Howland; entertainment committee, C. C. Howland, E. Gutche, Edward Voss, Harold Luke, Edward Eaton, S. W. Weber; house committee, William Stately, Verne Runyon, Adolph Krueger.

At the December meeting of the West Side Motorcycle Club, Philadelphia, Penn., the following officers were elected: President, Fred Ulmer; vice president, Frank Morton; secretary, Stanley Milne; treasurer, D. F. Hopkins; captain, Stanley Milne; first lieutenant, F. Morton; second lieutenant, C. Tyson.

The Pittsburgh Motorcycle Club, Pittsburgh, Penn., has elected the following officers for the ensuing year: President, S. J. Martin; vice president, A. J. Thompson; secretary, H. E. Simon; assistant secretary, R. Davis; treasurer, H. Neville; director, A. Hayes.

Harry Wheat, one of the local dealers in Wheeling,

W. Va., recently entertained the members of the Wheeling Motorcycle Club with a banquet at its club rooms.

The annual endurance run of the Imperial Motorcycle Club, Brooklyn, N. Y., has been set for Jan. 11. The distance will be about 150 miles and the prize a silver medal.

The Alton Motorcycle Club has been formed by riders in Alton, Ill., with the following officers: President, Oscar Pence; vice president, Walter Gabriel; secretary, Clyde Herrin; treasurer, Emil Budde; captain, Ernest Jacoby; first lieutenant, Joseph Davis, Jr.; second lieutenant, Roy Maxfield.

The Gadsden Motorcycle Club, Gadsden, Ala., has affiliated with the Federation of American Motorcyclists as No. 422, with 12 members.

The Bay Ridge Motorcycle Club, Brooklyn, N. Y., has removed its club rooms to 3621 Fort Hamilton avenue, where they are more centrally located.

The Milwaukee Motorcycle Club, Milwaukee, Wis., has elected the following officers: President, Charles Greer; vice president, W. H. Parsons; secretary, J. H. Emde; assistant secretary, Robert Hayden; treasurer, Charles T. Martin.

The Chicago Indian Motorcycle Club, Chicago, Ill., has elected the following officers: President, A. C. Hartel; vice president, C. C. Posvic; financial secretary, A. C. Hertzner; recording secretary, W. W. Bohnsack; treasurer, J. Collins.

The Beloit Motorcycle Club, Beloit, Wis., has selected the following officers for the ensuing year: President, Arthur Sheveland; vice president, Claude Hirst; secre-



Party of Riders Negotiating Poor Roads Off Beaten Path.

tary, R. G. Talbot; treasurer, Herbert Yonkers; captain, Claude Smith.

The riders in Indiana City, Mich., have organized the Michigan City Motorcycle Club with the following officers: President, Bert Ross; vice president, Floyd McKinley; secretary, Otto Palm; treasurer, Slater Craft.

### JOIN THE F. A. M.

which is the National Organization fostering the interests of motorcyclists along legislative and other lines. Cut this out, mail it, and you will get the reasons.

#### E. M. ESTABROOK

Chairman Membership Committee Federation  
American Motorcyclists,  
BANGOR, MAINE.

Please send me the F. A. M. Booklet and all information interesting to prospective members.

Name.....

Address.....



# NEWS OF THE MANUFACTURER AND DEALER.

The following concerns have been incorporated recently to manufacture or deal in motor cars, accessories, etc.:

**Wheeler Elam Company**, Valparaiso, Ind.; \$15,000; to deal in automobiles; W. G. Elam, R. W. Elam, R. S. Wheeler.

**American Motor Truck Company**, Detroit; \$10,000; A. H. Reinhold, W. K. Ackerman, John D. MacKay.

**Tri-City Motor Car Company**, Charleston, W. Va.; \$10,000.

**Heck-Smith Company**, Camden, N. J.; \$5000; George L. Heck, David E. Smith and others.

**Dart Motor Truck Company**, Boston, Mass.; \$5000; Walter F. Magill, Gertrude A. Magill, Stephen J. Richards.

**Arlington Motor Car Company**, Kearney, N. J.; \$100,000; general automobile business.

**F. R. Boice & Co.**, Red Bank, N. J.; \$25,000; automobiles; L. S. Thompson, F. R. Boice.

**Utah-Idaho Auto Company**, Logan, Utah; \$25,000.

**Bristol Motor Car Company**, Attleboro, Mass.; \$3000; John H. Nerney, Dolly B. Nerney, Carlton H. Nerney, Paul H. Nerney.

**Aero Motor Vehicle Company**, Brooklyn, N. Y.; \$10,000; Herbert Lovinger, 789 Elsnmere place.

**Patch, Griffen & Caulfield Company**, Boston, Mass.; \$15,000; E. A. Patch, A. A. Caulfield, C. B. Jackson.

**C. A. Martin Manufacturing Company**, Chicago, Ill.; \$2000; C. A. Martin, George T. Glover, William Schulze.

**Luxmore Differential Company**, Chicago, Ill.; \$7500; accessories and machinery; Edbert Robertson, Lazarus Krinsky, John L. Anderson.

**Wisconsin State Rubber Company**, Milwaukee, Wis.; \$10,000; tires and accessories; Harold D. Detienne, Mrs. Wallis, Mrs. Detienne.

**Dreadnought Tire & Rubber Company**, Orangeville, Md.; \$1,000,000; to manufacture tires.

**Lock Robe-Rail Company**, New York City; \$5000; accessories; C. W. Crow, W. G. Grichton, R. W. Johnson.

**Kardell Bros. Company**, Utica, N. Y.; \$20,000; supplies.

**Blowers-Rheubottom Rubber Company**, Wilmington, Del.; \$500,000; to manufacture tires; W. R. Blowers, Toronto, Can.; A. Rheubottom, Pittsburg, Penn.; G. D. Hopkins, Wilmington.

**Vaughn-Harris Company**, Vermillion, S. D.; \$25,000; manufacture an automobile truss.

**Merchants Motor Sales Company**, New York City; \$120,000; B. Cukor, H. V. Radonitz, C. J. Quinn.

**Knight Motor Repair & Sales Company**, Cleveland, O.; \$5000; A. House, F. R. Kyle, F. X. Schuat, C. L. Allen, W. H. Buckins.

**Silent Eyler Motor Company**, Chicago, Ill.; \$15,000; to deal in motorcycles and accessories; W. M. Melling, A. H. Doorfler, F. Doorfler.

**Detroit, Barton Auto Top Company**, Lansing, Mich.; \$10,000; manufacture accessories; Albert Barton, George S. Field, Ida M. Willis.

**Tacoma Transit Company**, Tacoma, Wash.; \$30,000.

**Missouri Southern Route Association**, Washington, Mo.; \$25,000; J. H. Dickbrader.

**Commercial Auto Body Company of Richmond**, New York City; \$12,000; William Herz, Casper A. Scheiper, Arthur W. Owen, 208 West 69th street.

**E. O. Proctor Company**, Ayer, Mass.; \$50,000; president and treasurer, Edw. O. Proctor; G. L. Donahue, W. L. Preble.

**United States Auto Supply Company**, Detroit, Mich.; \$10,000; to deal in automobiles; Daniel Alpert, Robert Washman and others.

**Ontario Motor Company**, Detroit, Mich.; \$10,000; to deal in automobiles; E. F. Garber, Charles L. Mann and others.

**Convertible Automobile Body Corporation**, New York City; \$250,000; L. Lewkowitz, E. I. Gottlieb, M. Kaplan.

**Automobile Remodelling Works**, Birmingham, Ala.; president, Charles S. Sibley; vice president, Kenneth Underwood; secretary-treasurer, Frank Brown Cornell.

## GARAGE AND DEALER.

**R. L. Brewster**, formerly foreman of the service department of the Independent Auto Company, has opened

a service and repair station at 916 Walnut street, Des Moines, Ia.

**J. M. Frederick** of the Frederick Auto Company, Elkhart, Ia., has opened a garage and agency on Walnut street, Des Moines, Ia.

**H. D. Gorby**, Pasadena, Cal., has opened a garage and repair shop at 29 South Lake avenue.

**The Bockelman Garage**, Beecher, Ill., has recently been opened.

**The Agency & Repair Store**, Three Rivers, Mich., has been opened by A. P. Yorrton and L. A. Yorrton of Jackson, Mich.

**Erickson & Bastedo**, New Brunswick, N. J., has opened a garage at 127 Church street.

**T. J. Walton**, St. Louis, Mo., formerly superintendent of the police garage, will open a repair shop at 2007 Locust street.

**Herbert Dowling**, Ann Arbor, Mich., is interested in a new company that will open a garage at Littleton, N. H. Mr. Downing will come East to look after the business.

**Henry Dean Bourne** and John Stone, Manchester, N. H., will open a new garage on Hanover street. It will be fitted with modern equipment and Chevrolet cars will be handled.

**The Art Auto Repair Company**, Toledo, O., has been opened on Madison street by Frank Schwind and Harold Stout.

**Elmer Denmab**, Bakersfield, Cal., is to open a garage at Yuba City, Cal.

**Mabel E. Hubbard**, Buffalo, N. Y., has petitioned the common council for permission to conduct a public garage at 486 Cornwall avenue.

**William E. Coleman**, Marlboro, Mass., has opened an automobile repair shop at 390 Maple street.

**John E. Braley**, Leominster, Mass., has opened a garage at 12 Manning street.

**Hunt & Magee**, Glendora, Cal., has established a new garage business under the name of the Central garage and will carry a full line of accessories and handle the Reo cars.

**Harry E. Blodgett**, Pasadena, Cal., is now operating the Park garage at 48 Orange place.

**Kratochville & Nehring**, Houston, Tex., has opened a garage on West Fourth street.

**A. E. Oliver**, Oneonta, N. Y., has leased the shop formerly owned by John A. Dowsett, and will open a garage and repair shop.

**Clifford Cadrom**, De Witt, Ia., has leased quarters and will open a repair shop.

**Boudinot & Cuthbert**, New Brunswick, N. J., has opened a garage at 3 Schuyler street, and will have the agency for the Studebaker, Hupmobile, Marion and American cars.

**The Dann Oil Cushion Spring Insert Company**, Chicago, Ill., has opened a service and spring repair department at 2246 South Indiana avenue.

**Dillon Stallcup**, Alliance, O., is to open a garage.

**Michael Buckley**, New York City, has leased property at 152 West 56th street and will open a garage.

**C. R. Yanington** is planning to enter the garage business at Stockdale, Tex.

**R. F. Flahburn**, Tucson, Ariz., local agent for the Vellie line, has opened a garage.

**Louis Bleick**, Appleton, Wis., has opened a salesroom at the corner of Washington and Morrison streets. He will handle the Mitchell and Detroit cars.

**The Iowa Motor Sales Company**, Des Moines, Ia., has been formed to act as distributor for the Vellie cars in central Iowa. N. A. Cruzan, formerly a dealer, is manager of the new company, which has located at 909 Walnut street.

**Joseph Judge**, who was formerly with the Pope-Hartford company and for the past three years manager of the Mogul Auto Company at Newburg, N. Y., has re-entered the trade for himself. He has secured the distribution of the Ford and Reo cars and will maintain headquarters in Spring Valley, with a branch at Haverstraw.

**The Athens Automobile Company**, Athens, Wis., has been formed by F. F. Chesak, Fred Lonsdorf and Frank Hubing.

**J. S. & E. C. Morrison**, El Paso, Tex., has taken over the agency for Hupmobile cars in that city. O. H. Baum,



**"American Made for American Trade"**

# **NEW DEPARTURE --BALL BEARINGS--**

**T**HE complete success of New Departure Ball Bearings in meeting the demands of the American car manufacturer for a bearing of quality, capacity, efficiency and durability, is attested by the fact that *two thousand skilled mechanics are operating ten and a half acres of modern machinery, producing ten thousand guaranteed bearings per day.*

May we send you catalog?



**The New Departure Mfg. Co.,** **Bristol, Conn.**  
Western Branch, 1016-17 Ford Bldg., Detroit

When Writing to Advertisers, Please Mention The Automobile Journal.



former agent, will confine his activities to the Chalmers and Peerless lines in the future.

**E. S. DeTamble** and **Carl H. Pine**, Los Angeles, Cal., have opened a salesroom at 825-827 South Olive street, where they will handle the Partin-Palmer cars.

#### WITH THE MANUFACTURER.

**The Maccarr Automobile Company**, Allentown, Penn., is planning to remove its factory to Scranton, Penn., locating in the old Cliff works building.

**The Westinghouse Air Spring Company**, Pittsburg, Penn., maker of a new air spring for automobiles, has opened factory branches at 244 West 48th street, New York City; 98 Massachusetts avenue, Boston, Mass.; 380 Elliott street, Cleveland, O., and other cities.

**The Meteor Motor Car Company**, Shelbyville, Ind., is planning to remove its factory to Piqua, O., and reincorporate under the laws of Ohio with a capital stock of \$50,000.

**Phineas Jones & Co.**, Newark, N. J., will locate a branch factory for the production of automobile wheels on South Los Angeles street, Los Angeles, Cal., and will incorporate in that state under the name of Phineas Jones & Co. of California. Latest machinery will be installed.

**The Goodyear Tire & Rubber Company**, Akron, O., is now occupying a plant that covers 50 acres and has a floor space of 1,550,605 square feet, or about 35 acres,

**Kingston Forbes**, engineer for the Palmer & Singer Manufacturing Company, New York City, has resigned his connection with the company.

**A. J. Interrieden**, sales manager for the Jones Speedometer Company, has resigned and is to join his old associate, **A. P. Warner**, in the latter's mining interests in New Mexico.

**W. O. Kennington** of the engineering department of the Remy Electric Company, Anderson, Ind., maker of the Remy starting, lighting and ignition apparatus, is in Europe for a two months' visit.

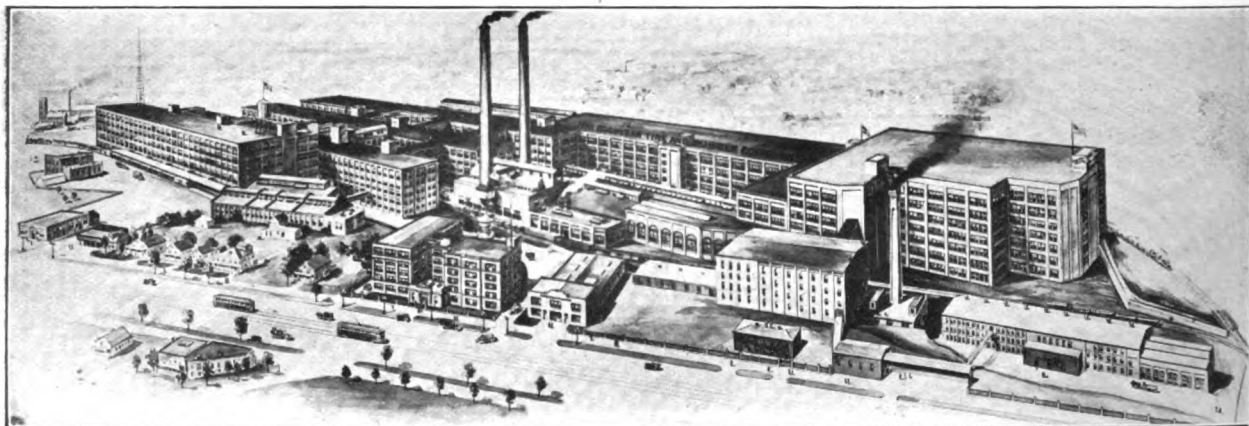
**Percy D. Stubbs**, who has been assistant sales manager of the Hudson Motor Car Company, Detroit, is to take complete charge of the Hudson sales west of Salt Lake City.

**George Wright**, formerly with the Gomery-Schwartz Motor Car Company as manager, and more recently secretary of the Cole Motor Company at Philadelphia, Penn., has been appointed branch manager for the Chevrolet Motor Company with headquarters at 332 North Broad street, Philadelphia, Penn.

**Charles Fisher** has been appointed district manager for the Mogul Motor Truck Company, St. Louis, Mo. His headquarters will be in New York City and he will cover the territory east of Chicago.

**William H. Stillwell**, who has been with the J. S. Bretz Company, New York City, has become sales manager for **Joseph Schaeffers**, Cleveland, O.

**The Chase Motor Truck Company**, Syracuse, N. Y., has placed on the market a kerosene motor roller farm tractor, designed for the severe condition of soil and topo-



General View of the Entire Plant of the Goodyear Tire & Rubber Company, Akron, O.

giving employment to 6500 people. It is possible for the Goodyear company to produce 10,000 automobile tires a day, in addition to the immense quantity of motor truck, motorcycle, bicycle and carriage tires that are turned out regularly. An accompanying illustration shows the entire plant of this concern.

**The Invader Oil Company**, New York City, announces that it has concluded arrangements with the Electric Appliance Company, New Orleans, La., to handle its complete line of Invader oils and greases, and I-O-C gear oils for the territory embracing Louisiana, Mississippi, the southern part of Alabama, the western coast of Florida and a small part of Arkansas and Georgia.

**The Frontier Specialty Company**, 728 Main street, Buffalo, N. Y., is issuing a patent warning to the trade, calling attention to the fact that it has secured the control of all rights under letters patent No. 642,167, granted Jan. 30, 1900, to F. R. Simms, for spark plugs for explosive engines. It is maintained that this patent covers the construction of the All-in-One spark plug, made by this concern.

**The Chevrolet Motor Company**, Flint, Mich., has erected a branch factory in New York City, where assembling work will be undertaken, as well as the preparation of cars for exportation.

**A. L. Longton**, who for the past 11 years has been in the employ of the Knox Automobile Company, Springfield, Mass., in various capacities from timekeeper to assistant superintendent, foundry superintendent, and latterly as manager of production and costs, has resigned.

graphy existing throughout the eastern United States. This tractor furnishes all traction and belt work required by the farmer.

**The Detroit Wagon Works**, Detroit, is making a new type tractor, which will be announced soon.

**The Detroit Steering Wheel & Windshield Company**, Detroit, has changed its name to the Metalwood Manufacturing Company. The change affects the name only.

**The General Vehicle Company**, Long Island City, N. Y., maker of G. V. electric and G. V. Mercedes gasoline trucks, has removed to its new five-story factory. The new building is one of four which are to be erected by the company, and when these are finished the concern will have one of the largest motor truck plants in the country.

**The Drigible Headlight Company**, Salt Lake City, Utah, recently incorporated with capital of \$10,000, has acquired a factory site at 325 South West Temple street, and it is expected that manufacturing will be begun with about 50 men in the near future. The officers of the company are: President, **Charles Dale**; vice president, **L. P. Amtoft**; treasurer, **E. R. Madsen**; secretary, **Frank Dale**.

**The Cox Brass Manufacturing Company**, Albany, N. Y., has opened a factory branch at 1216 Van Ness avenue, San Francisco, Cal., in charge of **Charles M. Weaver** as manager.

**The Monahan Vehicle Company**, Providence, R. I., has installed in its painting department a new compressed vapor cleaning system for cleaning cars before painting.



## COMING EVENTS.

## January.

- Jan. 2-10—Importers' Salon, Hotel Astor, New York City.  
 Jan. 3-10—Pleasure car show, Grand Central Palace, New York City.  
 Jan. 4-8—Winter meeting, Society of Automobile Engineers, New York City.  
 Jan. 5-10—Show, Los Angeles, Cal.  
 Jan. 10-16—Show, Milwaukee, Wis.  
 Jan. 10-17—Show, Cleveland, O.  
 Jan. 10-17—Show, Philadelphia, Penn.  
 Jan. 10-21—Show, Brussels, Belgium.  
 Jan. 12-17—Show, Bridgeport, Conn.  
 Jan. 14-21—Maritime motor show, St. John, N. B.  
 Jan. 17-24—Show, Pittsburg, Penn.  
 Jan. 17-24—Show, Detroit, Mich.  
 Jan. 19-24—Show, Washington, D. C.  
 Jan. 24-31—Pleasure car show, Montreal, Que.  
 Jan. 24-31—Show, Rochester, N. Y.  
 Jan. 24-31—Pleasure car show, Coliseum, Chicago, Ill.  
 Jan. 26-31—Show, Scranton, Penn.  
 Jan. 31-Feb. 7—Show, Minneapolis, Minn.

## February.

- Feb. 2-7—Pleasure car show, Buffalo, N. Y.  
 Feb. 3-7—Show, Kalamazoo, Mich.  
 Feb. 3-7—Commercial car show, Montreal, Que.  
 Feb. 4-7—Show, St. Joseph, Mo.  
 Feb. 7-12—Show, Seattle, Wash.  
 Feb. 9-14—Truck show, Buffalo, N. Y.  
 Feb. 9-14—Show, Grand Rapids, Mich.  
 Feb. 14-21—Show, Pittsburg, Penn.  
 Feb. 16-21—Canadian national show, Toronto, Ont.  
 Feb. 16-21—Show, Kansas City, Mo.  
 Feb. 18-21—Show, Bloomington, Ill.  
 Feb. 21-28—Show, Hartford, Conn.  
 Feb. 21-28—Show, First Regiment Armory, Newark, N. J.  
 Feb. 21-28—Pleasure car show, Cincinnati, O.  
 Feb. 23-28—Show, Omaha, Neb.  
 Feb. 24-28—Show, Syracuse, N. Y.

## March.

- March 2-4—Commercial car show, Cincinnati, O.  
 March 2-6—Show, Fort Dodge, Ia.  
 March 7-14—Pleasure car show, Mechanics' Building, Boston, Mass.  
 March 9-14—Show, Des Moines, Ia.  
 March 17-21—Truck show, Mechanics' Building, Boston, Mass.

## April.

- April 9-15—Show, Manchester, N. H.

## May.

- May 30—500-mile race, Indianapolis, Ind.

## July.

- July 25-29—Grand Prix race, Belgium.

## MOLINE-KNIGHT TEST.

## Unofficial Reports Indicate New Motor Is Showing Satisfactory Horsepower.

While the official test of the Moline-Knight motor, which was begun by the Automobile Club of America in its laboratory in New York City, Dec. 19, will not be completed until Jan. 3, unofficial information states that the engine has been developing not less than 38 horsepower, with a maximum of 38.8. The maker, the Moline Automobile Company, East Moline, Ill., states that the motor is a four-cylinder unit, with bore of four inches and stroke of six, which would give a rating under the S. A. E. formula of 25.6 horsepower. Complete details of the test, with the official results, are expected in time for publication in the Jan. 10 issue of The Automobile Journal.

## TRI-PHOON AIR PUMP.

## Compact Three-Cylinder Unit Adaptable to Used Cars Operating on Novel Principle.

That the power tire pump meets with the approval of the motorists is noted by the growing tendency of the manufacturer to include it as standard equipment on the new models. There are, however, many owners who desire the convenience and to meet this demand the Green & Swett Company, 737 Boylston street, Boston, has brought out the Tri-Phoon three-cylinder air pump shown herewith. Some idea of its compactness may be obtained from its dimensions, which are: Height, 5.5 inches; diameter, 3.5, and weight, five pounds.

The pump was constructed especially for the used car, although adaptable to all makes. It differs from conventional designs in that the three reciprocating pistons are driven by a high powered rotary cam, and are controlled on the cam surface by means of roller bearings. The last named and the cam are constructed from the finest quality of steel, hardened and ground. In place of leather washers, specially constructed metal piston rings are utilized. The lubrication system is simple and efficient; in fact, the maker states that it is impossible for the pump to get out of order. The guarantee is liberal, the company replacing free of charge within one year any defective or faulty construction.



Tri-Phoon Three-Cylinder Air Pump.

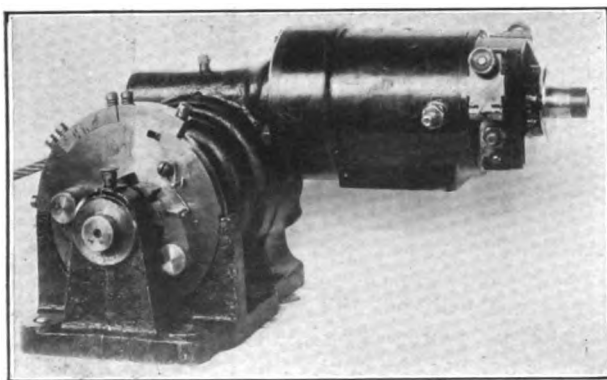
One of the qualities of the Tri-Phoon is its adaptability to the motor of a car, the company being prepared to supply brackets and fittings, which make its installation a simple and easy matter. It is also stated that an instance is yet to be recorded where the pump cannot be fitted and successfully operated. Drive may be taken from any convenient shaft by gears or silent chain. The pump is placed in service by a unique shifting lever. The maker lays great emphasis on its efficiency, stating that at 800 revolutions a minute it will deliver a steady flow of pure, fresh air equal to a pressure drawn from an air tank charged 115 pounds to the square inch. Suitable length of high grade hose and a pressure gauge are included.



## HARTFORD ANNOUNCES ELECTRIC BRAKE.

**T**HE process of electrifying the gasoline car has advanced another step, for the electric brake has arrived. E. V. Hartford, of the Hartford Suspension Company, Jersey City, N. J., has made public details of the E. V. Hartford electric brake, which he states is the result of three years' study and experimentation. The device is manually controlled, the hand controller being so mounted under the steering wheel that it can be operated by the driver without removing the hands from the wheel. It is stated that the lever may be actuated to obtain any desired friction effect and that a pressure several times that possible with ordinary methods is obtainable.

The system comprises a small, high speed electric motor mounted on a suitable base, bolted to the frame and preferably under the rear seat.



**Hartford Electric Brake, Comprising Drum Actuated by Electric Motor, and Controlled by Lever Under Steering Wheel—It Is Stated That Any Desired Braking Effect Can Be Obtained with Movement of Finger.**

A non-reversible worm on the end of the armature shaft actuates a spiral gear mounted on a shaft carried transversely to the motor shaft. This transverse shaft carries a steel drum upon which a steel cable is wound, one end of the cable being secured to the drum, while the other is connected with the emergency brake lever. The cable, in other words, replaces the usual rod connecting the brake lever with the equalizer or brake rods.

Between the drum and the worm gear drive, inside of the case enclosing the mechanism, is an adjustable friction clutch which provides sufficient pressure to transmit the maximum braking efficiency. Beyond a certain point, however, the clutch will slip. This eliminates undesirable stresses upon the cable, etc., preventing breakage.

Upon a slight movement of the control lever forward, the electric motor is energized and movement imparted to the drum, winding the cable, etc. By a maximum movement of the control lever the brakes may be locked instantly. It is claimed that as nice a braking effect may be obtained as by manual application. Two releases are provided, one being progressive, similar to the braking effect obtained on the first contact, and the other a full release which acts instantly.

Current for operating the device is obtained from the storage battery of the lighting and starting system, and the braking motor is wound for six, 12 or 24-volt batteries. It is stated that the controller may be operated by one finger; that it may be installed so as to be used by both the driver and occupants of the rear seats, and that the friction clutch may be adjusted to any predetermined pressure. It is also held that the clutch prevents excessive stresses being placed upon the braking mechanism.

### MAXWELL SERVICE POLICY.

**Company Is Prepared to Furnish Spare Parts for 244 Models of Old Cars.**

Although it is somewhat common practise for concerns, when succeeding other bankrupt companies, to dispose of the repair parts business to those who are willing to contract for the supply of such parts to owners, the Maxwell Motor Company, Inc., Detroit, which succeeded the old United States Motor Company, has decided upon an entirely new policy in this respect. This concern announces that it has concentrated the entire spare parts business in one plant at Newcastle, Ind., where it is prepared to furnish replacement fittings to 122,000 owners of 244 models of old cars, these including Stoddard-Daytons from 1905 to 1914, Columbia gasoline and electric machines from 1906 to 1914, Everitt cars of any model and Brush, Sampson and Courier cars.

With a very few exceptions, every part required can be supplied immediately, and J. E. Burns, head of the service plant, states that 95 per cent. of the orders received are filled within 24 to 48 hours. It is estimated that the Maxwell Motor Company carries an investment of \$1,750,000 in plant, machine tools and repair parts at this Newcastle factory. The time and labor expended in this project has also been considerable.



# DOVER NEW HEADLINERS

## New Dover Galvanized Garage Funnel



## NEW DOVER ELECTRIC LIGHT BULB CASE

Made of Extra Heavy Steel  
WITHOUT A SEAM

## New Dover Garage Soap Economizer

Reduces Soap Con-  
sumption ONE HALF.  
Saves all Waste and  
Prevents THEFT.

It works on the same  
principle that the com-  
mon Soap Shaker does  
in washing dishes.

Made of Heavy Gal-  
vanized Perforated  
Steel



DOVER STAMPING  
& MFG. COMPANY.

CAMBRIDGE

MASSACHUSETTS.



*Mea*

Magneto

S. R. O. BALL BEARING

MARBURG BROS., Inc.,

Sole Importers

Detroit

1790 Broadway, New York

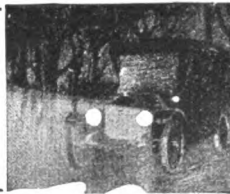
Chicago

## "The right way to light the way" Aplco Electric Lighting System

Penetrates fog, mist and rain as well  
as darkness. It is a simple, economical  
and reliable electric lighting system.

Write for full particulars.

THE APPLE ELECTRIC COMPANY  
74 Canal St., Dayton, Ohio



## "THE TUGBOAT OF LAND COMMERCE"

SOLVES THE  
HEAVY TRUCKING  
PROBLEM



*Knox*

MARTIN  
TRACTOR

SEND FOR CATALOGUE

KNOX AUTO CO.,

SPRINGFIELD,  
MASS.

Six Cylinder  
65 H. P.  
Equipped  
with Vulcan  
Electric Gear  
Shift

**HAYNES**

America's First Car

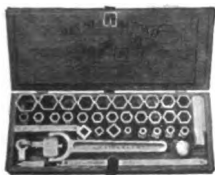
Four Cylinder  
40 H. P.  
Equipped  
with Vulcan  
Electric Gear  
Shift

Our advertising campaign will send a buyer into  
your showroom more than half convinced that he  
should own a Haynes; the sale, however, results  
only from a successful demonstration; it is our  
firm belief that, as a Haynes dealer, you possess  
more than a sufficient number of convincing argu-  
ments to make every demonstration result in a  
quick and profitable sale.

May we tell you why we believe this?

**THE HAYNES AUTOMOBILE COMPANY**

6 Main St., Kokomo, Indiana.



Bay State Autokit, No. 1, \$10

Bay State Autokit, No. 2, \$7.50

Bay State Stickit, \$3

GEO. A. CUTTER, Sales Agent  
Taunton, Mass.

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# THE NATIONAL Automobile Shows



Under Auspices of Automobile Chamber of Commerce, Inc.

## At New York

New  
Grand Central **PALACE**

January 3 to 10

**Passenger Cars—Motorcycles—Accessories**  
**One Show—One Building**

At CHICAGO, Jan. 24 to 31, Coliseum and 1st Reg't Armory

*Both Shows Bigger and Better Than Ever*

S. A. MILES, Manager

7 East 42nd Street, New York City

**"The Car of No Regrets"**  
**\$1095** with Equipment  
Ward Leonard Starter and Generator  
for \$100 net additional

# KING

See the KING before you buy! It's fairness to yourself. You can't afford to purchase *any* car until this highest of motor values has been investigated. The KING gives *more* service, style, economy, power, riding comfort, conveniences and equipment than can be had in any car near its price, and has desirable, patented features which *no other* car can offer.

### FEATURES OF MODEL B, 30-35 HORSE-POWER

*Two Styles—One Chassis—Touring Car and Roadster*

Cantilever Rear Springs  
Long-stroke Motor  
Unit Power Plant

Three-point Suspension  
Gemmer Steering Gear  
Complete Electric Lighting

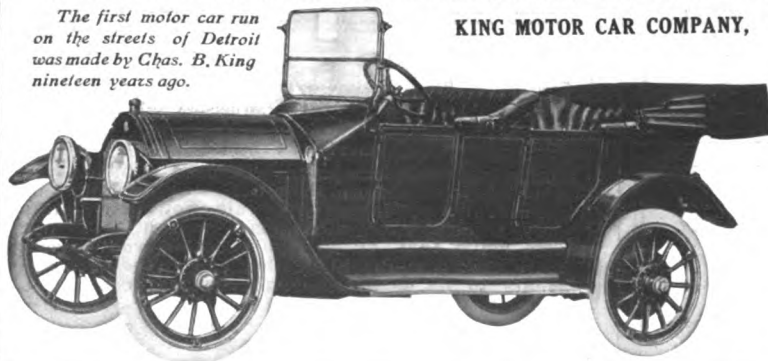
Full-floating Rear Axle  
Left-hand Steer  
18-inch Steering-wheel

Hyatt Roller Bearings  
Center Control  
112-inch Wheel-base

Briggs Magneto  
Stromberg Carburetor  
20-inch Rear Doors

Rain-vision Ventilating Windshield; Silk Mohair Top; Quick-attachable Curtains; Quick-detachable and demountable Rims; Stewart Warner Speedometer (listed \$50); Electric Horn; Extra Rim; Tire-irons; Pump; Jack; Tire-repair Outfit; Tools, etc., all in regular equipment.

*The first motor car run  
on the streets of Detroit  
was made by Chas. B. King  
nineteen years ago.*



**KING MOTOR CAR COMPANY, 1300 to 1324 Jefferson Ave., Detroit, Mich.**

New York Agency and Showrooms,  
Broadway at 52d St.

New York Service Department,  
244 to 252 West 54th St.

**AGENCY FOR CANADA**  
King Motor Sales Co. of Canada,  
London, Ontario

**ATTENTION, AGENTS!** Every KING sold sells others. If we could show the KING to every prospective purchaser of a moderate-priced car, we would sell a year's output monthly. In service and style, it far exceeds any car of its class. Write or wire today for territory.

When Writing to Advertisers, Please Mention The Automobile Journal.



# EISEMANN

## The Eisemann Magneto Co.

Sales and General Offices

BUSH TERMINAL - - BROOKLYN, N. Y.

### THE WISE AUTOMOBILE BUYER WILL BUY CARS "EISEMANN" EQUIPPED

It's service that counts—and the ignition equipment is vital to the service of any car—whether on a pleasure trip or a hard road race—

#### 11 OUT OF 19 CARS

which finished the Indianapolis to Pacific tour with perfect scores were "EISEMANN" equipped—

#### 45 PER CENT. OF ALL CARS

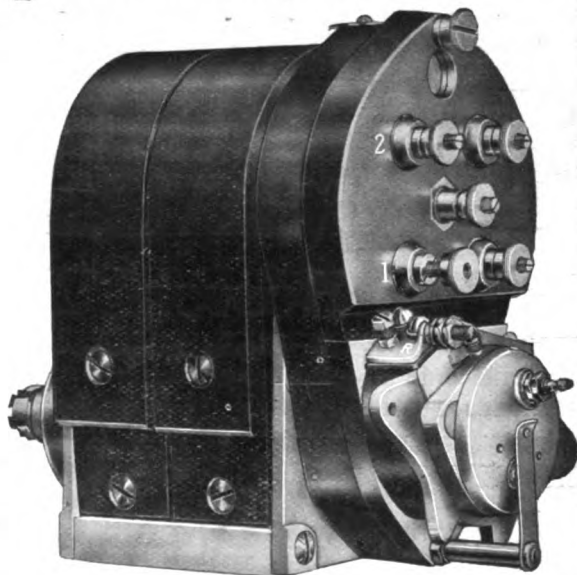
shown at the recent Olympia Show in London were "EISEMANN" equipped—

**More Than 73 Car and Truck Mfrs.** are today using "EISEMANN" standard products.

#### WHY? BECAUSE SERVICE COUNTS

Since moving our general offices from New York City to our present home, the EISEMANN CO. has established a new service station in New York City at 123 West 52nd St., in charge of Mr. James Rohde.

No Exhibit at the Shows—  
Customers will be welcomed at our factory.



# The "Black Eagle" Spark Plug

PATENTED

## 50 Cents Is Enough

The "Black Eagle" Spark Plug has made good because it was designed and manufactured with this result in view.

A person in close touch with the supply and manufacturing ends of the trade was a visitor at our factory recently, and was shown the details of construction, including the machinery, testing, and assembling of the "BLACK EAGLE" Spark Plug. What he said we believe will be of interest to you, as it indicates the effort on our part to supply a high grade plug at a reasonable price. We therefore quote below his impressions.

"I am simply amazed at the workmanship, material, and construction of the 'BLACK EAGLE' Spark Plug. When I saw this plug advertised at a price of 50c to the consumer, I naturally supposed it was a cheap, common, plug such as you occasionally find in jobbing houses on the bargain counter. I am convinced, after seeing these plugs tested, and examining minutely the machine parts which enter into their construction, that no better porcelain spark plug is offered by any one, regardless of the price they ask."



We are not influenced by what our competitors charge for spark plugs! We have ignored price precedent, for the reason that a high grade spark plug can be manufactured and sold at 50c each, and that is enough.

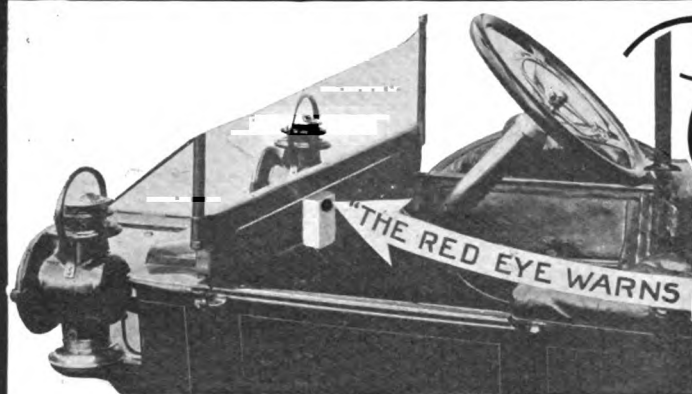
Sent prepaid on receipt of price. Made in all standard threads.

## THE STANDARD CO.

## Torrington, Conn., U. S. A.

When Writing to Advertisers, Please Mention The Automobile Journal.





# Right on the Dash

"Does away with series wiring and standardizes your lamp equipment"

## The Boston Tail Light Detector

Does what its name indicates, tells you when your rear light fails to work, saving you court fines and court records, as well as provides you with that secure feeling desired by all automobilists.

Easy to attach to all makes of cars, no electrician required. Guaranteed for life of the car.

**PRICE \$5.00** IN ALL FINISHES

**HARDING SPECIALTIES Co. Inc.**

... Manufacturers ...

**755 Boylston St. - - - Boston, Mass.**

Dealers and Garage Owners will do well to get prices for their respective territories.

*Write at once for terms.*



### GEISZLER NON-SULPHATING STORAGE BATTERIES

Guaranteed perfect satisfaction or money refunded

**SIZE 66 - \$20.00**

GEISZLER BROS. STORAGE BATTERY COMPANY  
514 West 57th Street, New York City

## HERZ PLUG

"BOUGIE MERCEDES"

**BEST ON EARTH**

BLUE STONE AND STEEL

**HERZ & CO.  
NEW YORK**

## "THE WELDING" COMPANY

SPRINGFIELD BOSTON HARTFORD HOLYOKE  
BRIDGEPORT SALEM

All Parts of Any Metal Welded and Guaranteed  
ALUMINUM CASES AND CAST IRON CYLINDERS A SPECIALTY

## COLE THE STANDARDIZED CAR



The car that started the stampede to standardization  
A Cole franchise is a valuable asset to any dealer. Find out about it.

**Cole Motor Car Co. of Indianapolis**

## J.M. Shock Absorber



Its efficiency is proved by scientific facts—not mere claims. Write for Ovington Data D. to **The J. M. Shock Absorber Co.**, 210 S. 17th Street, Philadelphia. Branches in Boston, Hartford, Providence, and all leading cities

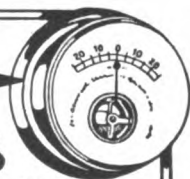
ALWAYS SPECIFY

**HOYT METERS**

AND GET YOUR MONEY'S WORTH

**HOYT ELECTRICAL INSTRUMENT WORKS**

PENACOOK, NEW HAMPSHIRE



Subscribe to  
**The Motor Truck**

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# Classified Buyers' Guide

A Handy Reference for Purchasers

## ACCESSORY MANUFACTURERS AND JOBBERS.

**Alsten & Goulding Co.**, 36 Foster St., Worcester, Mass.  
**Auto Parts Co.**, Providence, R. I.

**Hopewell Brothers**, Newton, Mass.

Branch: 1974 Broadway at 67th St., New York.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.

**Miller, Chas. E.**, 97-103 Reade St., New York.

Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave. and 2782 Broadway, New York; 1421 Bedford Ave., Brooklyn, N. Y.; 318 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 259 Peachtree St., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.

**Milwaukee Auto Specialty Co.**, 128 Second St., Milwaukee, Wis.

**Motor Parts Co.**, 185-187 Columbus Ave., Boston; 818 No. Broad St., Philadelphia; Springfield, Mass.

**Northwestern Chemical Co.**, Marietta, O.

**Waite Auto Supply Co.**, 81 Exchange place, Providence.

## ACETYLENE TANKS. (See Tanks.)

## AIR COMPRESSORS AND TANKS.

**Williams Foundry & Machine Co.**, Akron, O.

## AMMETERS AND VOLTMETERS.

**Hoyt Electrical Instrument Works**, Penacook, N. H.

## AUTOMOBILES. (See Cars.)

## AUTOMOBILE SPECIALTIES.

**Cox Brass Mfg. Co.**, Dudley Ave., Albany, N. Y. (Brass Goods.)

## BALLS AND BALL BEARINGS.

**Boyd, F. Shirley**, 903 Boylston St., Boston. (R. I. V.)

**Hyatt Roller Bearing Co.**, Detroit.

**Marburg Bros., Inc.**, 1790 Broadway, New York. (S. R. O.)

**New Departure Mfg. Co.**, Bristol, Conn.

**Rhineland Machine Works Co.**, 140 W. 42nd St., New York City.

Branches: 1254 Michigan Ave., Chicago, 650 Woodward Ave., Detroit; 1424 Vine St., Philadelphia; 220 Motor Mart, Boston.

**R. I. V. Co.**, 1771 Broadway, New York. (R. I. V.)

## BATTERIES.

**Electric Storage Battery Co.**, Philadelphia. (Exide.)

**Gelassler Bros. Storage Battery Co.**, 514 W. 57th St., New York.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City. (J-M.)

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Baker Motor Vehicle Co., Cleveland. (Baker.)

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Cole Motor Car Co., Indianapolis, Ind. (Cole.)

Empire Automobile Co., Indianapolis, Ind. (Empire, Lit-  
tle Aristocrat.)Haynes Automobile Co., 166 Main St., Kokomo, Ind.  
(Haynes.)Jackson Automobile Co., 1400 Main St., Jackson, Mich.  
(Jackson.)

Keeton Motor Co., Detroit. (Keeton.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis.  
(KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

Maxwell Motor Co., Inc., Detroit. (Maxwell.)

Mercer Automobile Co., 1100 Whitehead Road, Trenton,  
N. J. (Mercer.)

Moline Automobile Co., E. Moline, Ill. (Moline.)

National Motor Vehicle Co., 1033 22nd St., Indianapolis.  
(National.)

Nordyke &amp; Marmon Co., Indianapolis. (Marmon.)

Owen &amp; Co., R. M., 19 W. 62nd St., New York City. (Reo.)

Paige-Detroit Motor Car Co., Detroit. (Paige.)

Pierce-Arrow Motor Car Co., Buffalo, N. Y. (Pierce-Ar-  
row.)

Reo Motor Car Co., Lansing, Mich. (Reo.)

Studebaker Corp., Detroit. (Studebaker.)

Stutz Motor Car Co., Indianapolis. (Stutz.)

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**CARS—GASOLINE COMMERCIAL.**

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**Blair Mfg. Co., Newark, O. (Blair.)**

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**Dart Manufacturing Co., Waterloo, Ia. (Dart.)**

**Driggs-Seabury Ordnance Corp., Sharon, Penn. (Vulcan.)**

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**Reo Motor Car Co., Lansing, Mich. (Reo.)**

**Studebaker Corp., Detroit. (Studebaker.)**

**Sullivan Motor Car Co., 1707 East Ave., Rochester, N. Y. (Sullivan.)**

**Willys-Overland Co., Toledo, O. (Overland.)**

**CARS—ELECTRIC COMMERCIAL.**

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**Baker Motor Vehicle Co., Cleveland. (Baker.)**

**Couple-Gear Freight-Wheel Co., 575 Buchanan St., Grand Rapids, Mich. (Couple-Gear.)**

**Branches:** 30th floor, Singer Bldg., New York; 178 Devonshire St., Boston.

**General Motors Truck Co., 26 Cadillac Ave., Pontiac, Mich. (G. M. C.)**

**Branches:** See Cars—Gasoline Commercial.

**General Vehicle Co., Long Island City, N. Y. (G. V.)**

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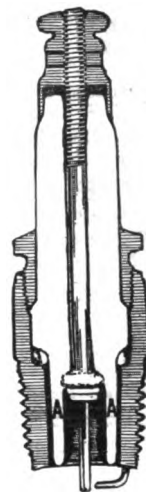
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**Milwaukee Auto Specialty Co.,** 128 Second St., Milwaukee.

**Northwestern Chemical Co.,** Marietta, O. (Carbonox.)

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**Apple Electric Co.,** Dayton, O. (Apico.)

**Dean Electric Co.,** Elyria, O. (Dynalux.)

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**Remy Electric Co.,** Anderson, Ind. (Remy.)

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**Dixon Crucible Co., Jos.,** Jersey City, N. J., (Graphite.)

**Eagle Oil & Supply Co.,** 104 Broad St., Boston. (Eagle-line No-Karbon.)

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Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (Asbestos.)

**SELF-STARTERS. (See Motor Starters.)****SHIMS, ETC.**

Rhineland Machine Works Co., 140 W. 42nd St., New York City. (Lindhe Laminated.)  
Branches: See Balls and Ball Bearings.

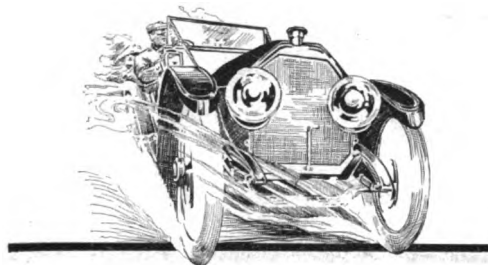
**SHOCK ABSORBERS AND SUPPLEMENTARY SPRINGS.**

Boyd, F. Shirley, 903 Boylston St., Boston.

Hudson Export and Import Co., 140 W. 42nd St., New York City. (A. V.)

(Continued on Next Page.)

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## A Barrel of Polarine

Will end your lubricating problem for a long while.

# Polarine

Flows freely down to zero.

Reduces friction to a minimum. Holds its body under any heat or pressure. Leaves practically no carbon.

Polarine comes in half barrels, barrels, gallon and five gallon cans.



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**RHINELAND**  
**BALL**  
**BEARINGS**  
*"INSURANCE FOR BUILDER*  
*AND USER"*  
**RHINELAND MACHINE WORKS CO.**  
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**Thousands of Car Owners All Over the World  
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Blue Ribbon Metal Polish  
 Blue Ribbon Nickel Polish  
 Blue Ribbon Auto Body Gloss  
 Blue Ribbon Radiator Leak-proof Cement

All BLUE RIBBON products strictly high class and fully guaranteed. BLUE RIBBON moves quick for the dealer—works fast for the consumer.

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Quill and Naomi Streets, Indianapolis, Indiana

W. A. Blackburn, Eastern Distributor, 335 Broadway, Moffat Bldg., New York

**REO THE FIFTH**

R. E. Olds' famous car—the leading car in its class. The latest model sells at \$1,175, completely equipped—electric starter and electric lights. 30 to 35 horsepower.

(219) **R. M. OWEN & CO., General Sales Agents**  
**REO MOTOR CAR CO., Lansing, Mich.**

**PERFECTION SPRING COMPANY**



High-Grade  
 Pleasure Car  
 and Motor  
 Truck Springs

**CLEVELAND, OHIO**

**REMY**

**STARTS—LIGHTS—IGNITES**

Six Volt System Does It All.  
 Write for our magneto exchange offer.

**REMY ELECTRIC COMPANY, Anderson, Ind.**

**KISSEL KAR**

Every Inch  
 a Car

made complete in one factory, under a system of inspection that obtains a perfection of detail surpassed in no other car. Investigate.

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**(BUYERS' GUIDE—Continued.)**

**J. M. Shock Absorber Co.,** 210 So. 17th St., Philadelphia. (J. M.)

**Sager Co., J. H.,** 271 South Ave., Rochester, N. Y. (Peerless.)

**SOAPS.**

**Hopewell Bros.,** Newton, Mass. (Paos.)  
 Branch: 1974 Broadway, New York.

**Northwestern Chemical Co.,** Marietta, O. (Dermalene.)

**SPARK PLUGS AND IGNITERS.**

**Alsten & Goulding Co.,** 36 Foster St., Worcester, Mass. (Alding.)

**Bosch Magneto Co.,** 223-225 W. 46th St., New York.  
 Branches: See Magnetos and Magneto Supplies.

**Helme Electric Co.,** Lowell, Mass. (H. E. Co. Priming.)  
**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City.

**Mosler, A. R., & Co.,** P. O. Box M, Mt. Vernon, N. Y. (Split Fire.)

**Rhineland Machine Works Co.,** 140 W. 42nd St., New York City.

Branches: See Balls and Ball Bearings.

**Splitdorf Electrical Co.,** 98 Warren St., Newark, N. J.  
 Branches: See Magnetos and Magneto Supplies.

**Standard Co.,** The, Torrington, Conn. (Black Eagle.)

**SPARK PLUG TERMINALS.**

**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City.

**SPEEDOMETERS, RECORDERS, ETC.**

**Johns-Manville Co.,** H. W., Madison Ave. and 41st St., New York City. (Electric.)

**Northwestern Chemical Co.,** Marietta, O. (Hydrometers and Thermometers.)

**Stewart-Warner Speedometer Corp.,** Chicago. (Auto-Meter.)

Branches: 116 Edgewood Ave., Atlanta, Ga.; 925 Boylston St., Boston; 720 Main St., Buffalo; 2420 Michigan Ave., Chicago; 807 Main St., Cincinnati; 2062 Euclid Ave., Cleveland; 1518 Broadway, Denver; 870 Woodward Ave., Detroit. 330½ North Illinois St., Indianapolis; 1618 Grand Ave., Kansas City; 748 S. Olive St., Los Angeles, Cal.; 1902 Broadway, New York; 302 N. Broad St., Philadelphia; 5940 Kirkwood Ave., Pittsburgh; 14 N. Seventh St., Portland, Ore.; 36-38 Van Ness Ave., San Francisco; 611 E. Pike St., Seattle, Wash.; 3923 Olive St., St. Louis; 559 Yonge St., Toronto, Can.

**SPRINGS FOR AUTOMOBILE SUSPENSION.**

**Marburg Bros., Inc.,** 1790 Broadway, New York. (Marburg-Hagen.)

**Perfection Spring Co.,** No. 1 Plant, 2414 Superior Ave., N. W.; No. 2 Plant, East 65th and Central Ave., Cleveland

**SPROCKETS.**

**Boyd, F. Shirley,** 903 Boylston St., Boston. (Baldwin.)

**STEEL, ETC.**

**Ward's Sons, E. T.,** 25 Purchase St., Boston, Mass. (Seamless.)

**STORAGE SYSTEMS—GASOLINE AND OIL.**

**Seafie & Sons Co.,** Wm. B., Pittsburg, Penn.  
 Branch: New York City.

(Continued on Next Page.)



## (BUYERS' GUIDE—Continued.)

## TAIL LIGHT DETECTORS.

**Harding Specialties Co., Inc.**, 755 Boylston St., Boston.  
(Boston.)

## TANKS, ACETYLENE GAS.

**Prest-O-Lite Company**, 271 East South St., Indianapolis.  
(Prest-O-Lite.)  
Branches: See Cylinder Cleaning Compound.

## TANKS FOR FUEL AND WATER.

**Sealife & Sons, Wm. B.**, Pittsburg, Penn.  
Branch: New York City.

## TANKS, TIRE INFLATING.

**Prest-O-Lite Co.**, 271 East South St., Indianapolis. (Baby  
Tire Filler, The Emancipator.)  
Branches: See Cylinder Cleaning Compound.

## TAPE, ASBESTOS.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St.,  
New York City.

## THERMOS CASES.

**Dover Stamping & Mfg. Co.**, Cambridge, Mass.

## TIRE ACCESSORIES.

**Cox Brass Mfg. Co.**, Dudley Ave., Albany, N. Y. (Holders.)  
**Shawver Co.**, Springfield, O. (Tools.)

## TIRE CASES.

**Hopewell Brothers**, Newton, Mass. (Hopewell.)  
Branch: 1974 Broadway, New York.

## TIRE CHAIN GRIPS. (See Chains.)

## TIRE PRESERVATIVES AND PROTECTORS.

**Northwestern Chemical Co.**, Marietta, O. (Tire-Lac.)

## TIRES—CASINGS AND INNER TUBES.

**Braender Rubber & Tire Co.**, Rutherford, N. J. (Braender.)

**Cataract Rubber Co.**, Wooster, O. (Cataract.)  
**Dayton Rubber Mfg. Co.**, Dayton, O. (Dayton Airless.)  
**Gaulois Tire Corp.**, 1926 Broadway, New York. (Gaulois.)  
**Goodyear Tire & Rubber Co.**, Madison St., Akron, O. (No-  
Rim-Cut.)  
Branches: In all principal cities.

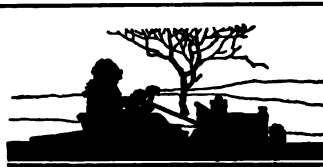
**United States Tire Co.**, Broadway and 58th St., New York.  
(Continental, G & J, Hartford, Morgan & Wright.)  
Branches: See Rims—Removable and Detachable.

## TIRES—CUSHION.

**Cataract Rubber Co.**, Wooster, O. (Cataract.)  
Branches: Boston, New York, Providence.

(Continued on Next Page.)

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## Winter Lubrication

If you plan to keep your car in service through the cold weather you especially need



because it is impervious to change in temperature. It lubricates as perfectly at zero as in warm weather.

If you are planning to house your car for the winter, it will pay you to clean out all the bearings and gears and repack them with NON-FLUID OIL. This lubricant does not dry or gum when the car is idle and will not cause the slightest corrosion of balls and rollers

NON-FLUID OIL excludes moisture and prevents rust.

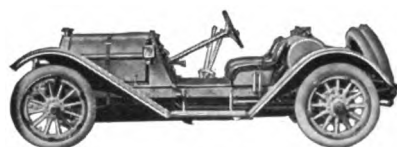
Ask your dealer for these lubricants packed in orange-colored cans bearing the above trade-mark.

**New York & New Jersey Lubricant Co.**  
165 Broadway, New York

Chicago: 1430 Michigan Ave.

Phila.: Race and Broad Sts.

Type 35  
Series J  
Raceabout  
Guaranteed  
Speed—Mile in  
51 Seconds



## MERCER

The car which most perfectly meets the medium weight demand. Dealers should carefully consider this fact.

Write today regarding unallotted Territory.

**MERCER AUTOMOBILE CO.**, 1100 Whitehead Road  
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## VALVOLINE OIL CO.

Heavy, Medium and Light  
**Automobile Oils**  
27 STATE STREET BOSTON, MASS.

## BRAENDER TIRES & TUBES

Are of the highest quality and the cheapest on mileage. They are built to last. Send for price list and particulars.

**BRAENDER RUBBER & TIRE CO.**  
Main Office and Factory RUTHERFORD, N. J.



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Next issue Jan. 15th.

### Accessory and Garage Journal

TIMES BUILDING, PAWTUCKET, R. I.

#### (BUYERS' GUIDE—Continued.)

##### TIRES—SOLID AND COMMERCIAL.

Goodrich Co., B. F., Akron, O. (Goodrich.)  
Polack Tyre and Rubber Co., 246 W. 59th St., New York City. (Polack.)  
United States Tire Co., Broadway and 58th St., New York.  
Branches: See Rims—Removable and Detachable.

##### TOPS AND ATTACHMENTS.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

##### TROUBLE FINDERS.

Hopewell Brothers, Newton, Mass. (Vibrator.)  
Branch: 1974 Broadway, New York.

TRUCKS AND TRACTORS—(See Cars, Commercial)

##### TRUNK RACKS.

Connecticut Steel & Wire Co., Hartford, Conn.

##### TUBING, GAS.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City.

##### VALVE GRINDERS.

Wall, J. H., 290 Hope St., Bristol, R. I. (Ford.)

##### VALVE LIFTERS.

Winsor Manufacturing Co., Providence, R. I.

##### VARNISHES, ETC.

Valentine & Co., 456 Fourth Ave., New York City; 343 S. Dearborn St., Chicago; 74 Pearl St., Boston.

##### VENTILATORS.

Wattles, C. B., 441 Butler Exchange, Providence, R. I. (Excelsior Adjustable.)

##### VOLTMETERS—(See Ammeters.)

##### VULCANIZERS.

Vanderpool Co., Springfield, O.  
Williams Foundry & Machine Co., Akron, O.

##### WELDING, AUTOGENOUS.

Autogenous Welding Equipment Co., Springfield, Mass.

##### WELDING OUTFITS.

Prest-O-Lite Co., 309 W. South St., Indianapolis. (Prest-O-Welder.)  
Branches: See Cylinder Cleaning Compound.

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Coes Wrench Co., Worcester, Mass.  
Cutter, George A., Taunton, Mass.

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# **Unity of Interest**

**The owners, the board of directors and the executive officers of the Pierce-Arrow Motor Car Company are one and the same group of men.**

**This means that the**

## **PIERCE-ARROW**

**organization is one of united individuality, hampered by no outside interference or syndicated control. It means that the Pierce-Arrow directors are free to utilize their full resources of capital, brains and energy to the attainment of their ideal—the successful building and marketing of the best possible motor trucks and pleasure cars.**

**Every individual directly interested in Pierce-Arrow financial success is a working unit in the Pierce-Arrow organization.**

**The Pierce-Arrow Motor Car Company of Buffalo, N. Y.**



# DELCO

ELECTRIC CRANKING LIGHTING IGNITION

## A Delco Equipped Car Has Won the World's Greatest Automobile Honors

An American motor car equipped with the Delco Electric Cranking, Lighting and Ignition System has been awarded the famous Dewar Trophy by the Royal Automobile Club of England.

The Delco system itself did not win this highly prized trophy, but it was so severely tested in the trials, and the record it made was so remarkable that some facts regarding it are bound to be of interest to motor car owners.

The trials that determined the award of the Dewar Trophy involved driving 1,000 miles over all sorts of roads at an average speed of 19.5 miles an hour. *This is somewhat misleading, however, as an exceptionally high rear axle gear ratio was used throughout the trial and the actual speed at which the electric generator was driven was the equivalent of only 13.2 miles per hour with a standard rear axle.*

During the entire trial which lasted 66 hours and 17 minutes, or more than three days and two nights, all electric lights were burned continuously.

Actual driving time, however, was only 51 hours. For over 15 hours all lamps were burned while no current was being generated.

The cranking device was used 130 times; an average of once every 30 minutes during the entire 66 hours.

And at the end of the trial the batteries were still suffi-

ciently charged to crank the engine 1,000 compressions and burn the side, tail and speedometer lights 20 additional hours.

In other words, in spite of the heavy and continuous drain on the batteries for over 66 hours, while the generator was being run at unusually low speed for only 51 hours, the battery was still well charged at the end of the trial.

Another very gratifying phrase of the Committee's report is found in the statement that—"IT WAS OBSERVED AND NOTED THAT THE IGNITION WAS PERFECT THROUGHOUT THE TRIAL."

And yet while this entire performance of the Delco equipment is very wonderful, it is not at all surprising to drivers of Delco equipped cars.

More than 75,000 automobile owners are duplicating, day after day in their own driving, the experiences of the Royal Automobile Club Committee.





VOL. XXXVI.

NO. 11.

# AUTOMOBILE JOURNAL

*\$1.00 the year*  
*10 cents the Copy*

PAWTUCKET R.I.

January 10, 1914

## WINTER LUBRICATION

Suppose an oil meets a low cold test.

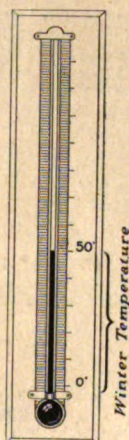
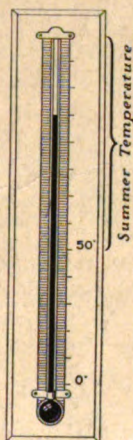
Will it be safe for winter use?  
Will it be safe for year-'round use?

Not necessarily. Oils that will not congeal in cold weather are common. But cold-tests alone are not safe guides to an oil's efficiency.

Added to that, our analyses and practical tests of 273 current models show that 113 of these cars operate most efficiently in summer with a grade of oil not best suited to winter conditions.

Different cold-weather problems are presented by the pressure type, the semi-force-feed and the direct-feed lubricating systems. They must be considered in connection with the other points of difference in the motor construction.

The summer oil meets your car's demands on hot summer days. The winter oil meets its



cold weather requirements. Some cars require the same grade of Gargoyle Mobiloil summer and winter.

These specific recommendations for different seasons and different cars naturally involve technical study and extra manufacturing effort.

We certainly would not undertake this laborious work if correct lubrication could be supplied without it.

The sooner the motorist comes to realize that efficient lubrication is not guess work, the sooner he will eliminate unnecessary wear and tear, and secure the best efficiency from his car.

A booklet on lubrication, which contains our complete lubricating chart, covering all American and leading foreign makes, will be mailed on request.

The various grades, refined and filtered to remove free carbon, are:

Gargoyle Mobiloil "A"  
Gargoyle Mobiloil "B"  
Gargoyle Mobiloil "D"  
Gargoyle Mobiloil "E"  
Gargoyle Mobiloil "Arctic"

**GARGOYLE**  
  
**Mobiloils**  
For correct automobile lubrication

In buying Gargoyle Mobiloil it is safest to order a barrel, a half barrel, or a *sealed* 5-gallon or 1-gallon can. *All are branded with the Gargoyle, which is our mark of manufacture.*

VACUUM OIL COMPANY, Rochester, U. S. A.

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Ford Bldg.BOSTON  
49 Federal St.NEW YORK  
29 BroadwayCHICAGO  
Fisher Bldg.PHILADELPHIA  
4th & Chestnut Sts.INDIANAPOLIS  
Indiana Pythian Bldg.MINNEAPOLIS  
Plymouth Building

Distributing warehouses in the principal cities of the world.



# BRAMPTON CHAINS

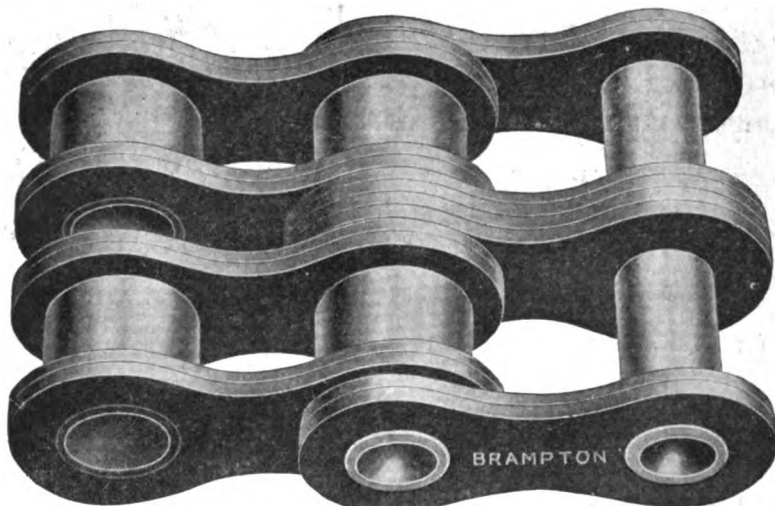
FOR

## Power Transmission

ON AUTOMOBILES AND ALL KINDS OF MACHINERY

"A chain is no stronger than its weakest link."

Brampton Chains  
HAVE NO  
WEAK LINKS.



Brampton Bros. were established in 1852 and their chain has always been recognized as being the one standard of the world.

THIS COMPOUND ROLLER CHAIN,  $2\frac{1}{4}$ " PITCH, HAS BREAKING LOAD OF 40 TONS.

Several Good Chains on the market, but

## Brampton Chains ARE BETTER

THE STRONGEST CHAIN IN THE WORLD

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97-99-101-103 Reade St., New York City

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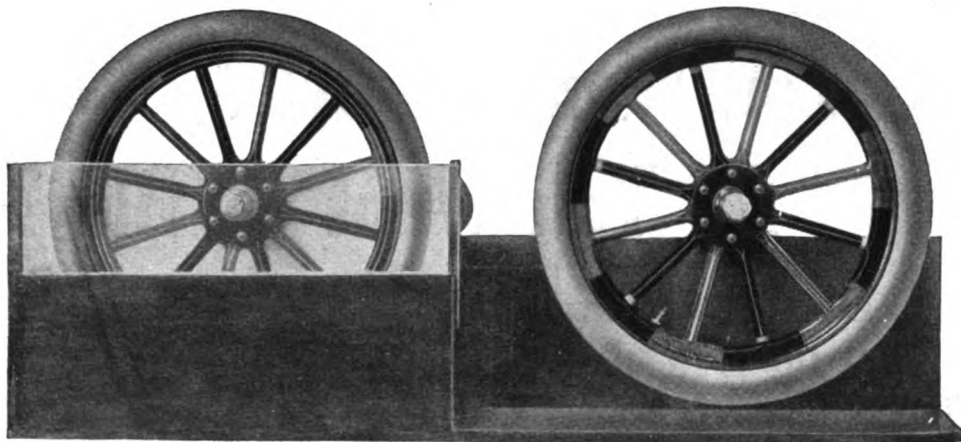
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# The Varnish That Defies Soap



Our exhibit at the automobile shows of an automobile wheel revolving in soapy water is a startling demonstration of our Vanadium Chassis Finishing, a varnish which is absolutely unharmed by the caustic action of automobile soap.

Six of the spokes of the wheel are finished with the best automobile gear varnishes heretofore made. They cannot withstand soap, and turn gray and lose their lustre. The other six spokes are finished with

## Valentine's Vanadium Chassis Finishing

These spokes stand up absolutely unharmed after weeks of exposure to soap and water. This is the varnish for the hood, fenders, and underparts of your car. It resists mud, road oil, grease, and the heat from the motor as well as it resists soapy water. It will keep the finish of these parts of your car in perfect condition many months after the ordinary varnish would be destroyed.

You will be interested in a new booklet we are issuing, "The Care of the Car." It tells all about how to preserve the finish of the car, and will, we are sure, prove of value to you. It describes Vanadium Chassis Finishing. We should like to send it to you, free of charge of course. Just fill out the coupon.

### Valentine & Company

*Largest Manufacturers of High Grade Varnishes in the World.*

456 Fourth Avenue  
New York

343 S. Dearborn Street  
Chicago

74 Pearl Street  
Boston

TRADE **VALENTINE'S** MARK  
VARNISHES

**FILL IN—TEAR OFF—MAIL TO-DAY**  
**Valentine & Company, 456 Fourth Ave., N.Y.C.**  
 Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 Please send me copy of  
 your booklet "The  
 Care of the  
 Car."

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# Do You Want To Sell? Do You Want To Buy?

Do you want to reach **15,000** trade interests in January and the same number in February?

## 15,000

Including Garagemen, Dealers in Cars, Agents for Cars, Accessories and Supplies, Repairmen, Jobbers, Accessory Men, and practically all other live concerns in all branches of the industry.

 **Guaranteed Distribution**  
**Guaranteed Trade Service** 

## Accessory and Garage Journal

**JANUARY ISSUE MAILED THE 25TH**  
**FEBRUARY ISSUE MAILED THE 25TH**

*Send for particulars of our Iron-Clad Circulation and  
Trade Service Guarantee*

**Times Building**

**Pawtucket, R. I.**



# CAMERON

## \$1200 4

Electric  
Lighting &  
Starter

FOUR  
SPEED  
DIRECT  
DRIVE

### Individuality

Producers of moderate priced cars in their desire to market a product at a low cost have all followed along the beaten path. Sheep-like they have all produced machines that offer nothing but sameness—in other words bulk at small cost. Stock parts gathered here and there, assembled in haste, is a story now familiar to the purchasing public.

THE CAMERON 4 STANDS AS THE MOST DISTINCTIVE LOW-PRICED CAR BUILT IN AMERICA. Its mechanical superiorities stamp it as the CAR OF INDIVIDUALITY. Built in our own factory, under personal direction of our own skilled engineers and designers, everything that typifies motoring perfection is incorporated into its make-up. It is the sturdiest and most economical automobile constructed.

### Cameron Features

#### FOUR SPEED DIRECT DRIVE

The problem of delivering maximum power at minimum cost has been solved by the use of the CAMERON FOUR SPEED DIRECT DRIVE TRANSMISSION. This type is absolutely the only one that permits of direct drive on all speeds, and DELIVERS 35 PER CENT MORE POWER THAN ALL OTHER MAKES.

#### THE MOTOR

The long stroke CAMERON motor cast en bloc is as distinctive as the transmission. Valves located in centre of combustion chamber gives highest efficiency to motor and the valve mechanism entirely enclosed insures quietness and freedom from wear.

THE CAMERON 4 has been constructed with a principle in view not a price. A MODERATE PRICED CAR—STURDY, COMFORTABLE, POWERFUL YET SIMPLE AND ECONOMICAL IN OPERATION.

THE CAMERON MFG. CO.

NEW HAVEN, CONN.

Our booklet describes in more detail the characteristics that make this car the distinctive one. May we send it to you?







# COES

## THE Wrench Supreme

Strength without bulk or clumsiness.

Ease of handling without slipping or bruising.

Perfect balance and right grip

Everything the motorist desires in a wrench is to be found in the "COES" TRADE MARK AUTOMOBILE MODEL, and you will never know perfect wrench service until you pin your faith to it.

It stands to reason that the 5 per cent. more you pay for a "COES" TRADE MARK wrench goes for 60 per cent. more quality and service—put this wrench in the tool kit and shop. You will get your money's worth.

Send for Literature Now.

### Coes Wrench Co.

WORCESTER, MASS.

J. C. McCARTY & CO.,  
21 Murray St., New York City

JOHN H. GRAHAM & CO.,  
113 Chambers St., New York City

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# Overland

## \$950

### Completely Equipped

With electric starter and generator—\$1075  
Prices f. o. b. Toledo

Electric head, side,  
tail and dash lights  
Storage battery  
35 Horsepower motor  
114-inch wheelbase  
Three-quarter floating  
rear axle

Timken and Hyatt bearings  
33 x 4 Q. D. tires  
Brewster green body  
nickel and aluminum  
trimmings  
Deep upholstery  
Mohair top, curtains and boot

Cowl dash  
Clear-vision  
windshield  
Stewart speedometer  
Electric horn  
Flush U doors with  
co concealed hinges

**T**OLEDO is now the second greatest automobile city in the world. The Toledo 1914 production exceeds that of every great motor car manufacturing center except Detroit.

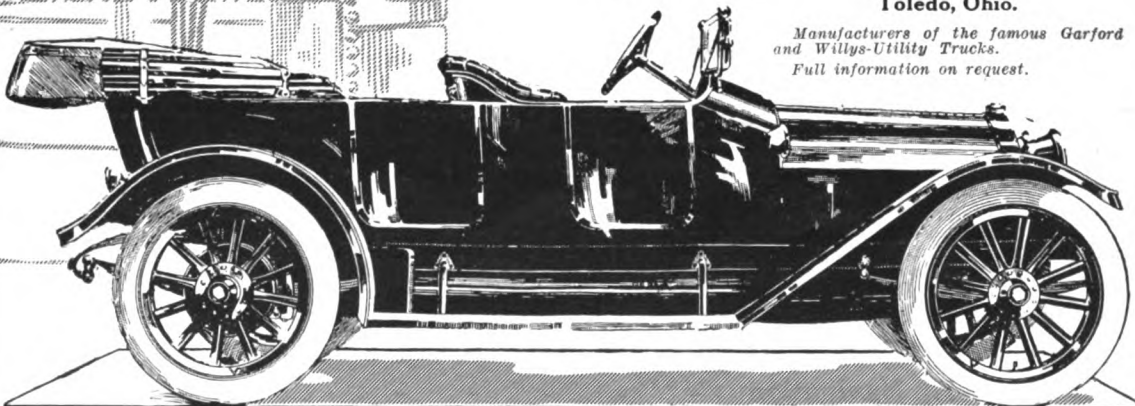
And this supremacy of Toledo is alone due to its only gasoline automobile factories—the Willys-Overland.

Catalogue on request. Address Dept. 52.

**THE WILLYS-OVERLAND CO.**

Toledo, Ohio.

Manufacturers of the famous Garford  
and Willys-Utility Trucks.  
Full information on request.

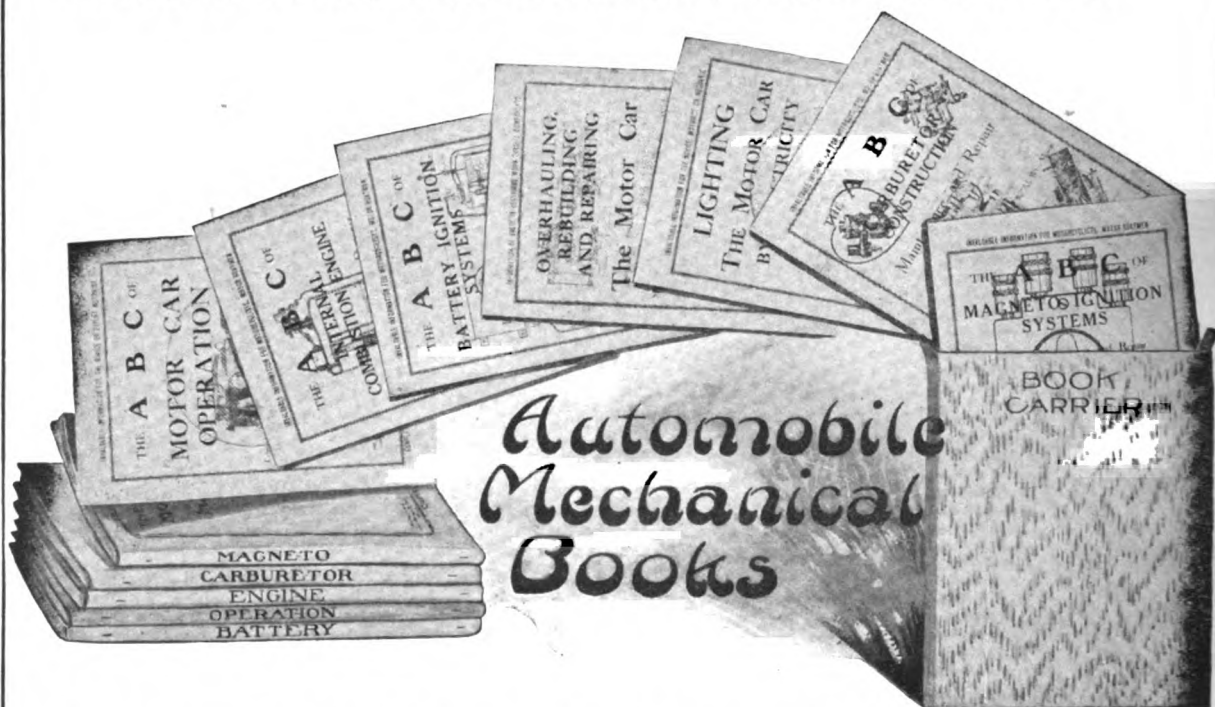


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ENGINE—MAGNETO—CARBURETOR—BATTERY—ELECTRIC LIGHTING—TIRES—CHASSIS  
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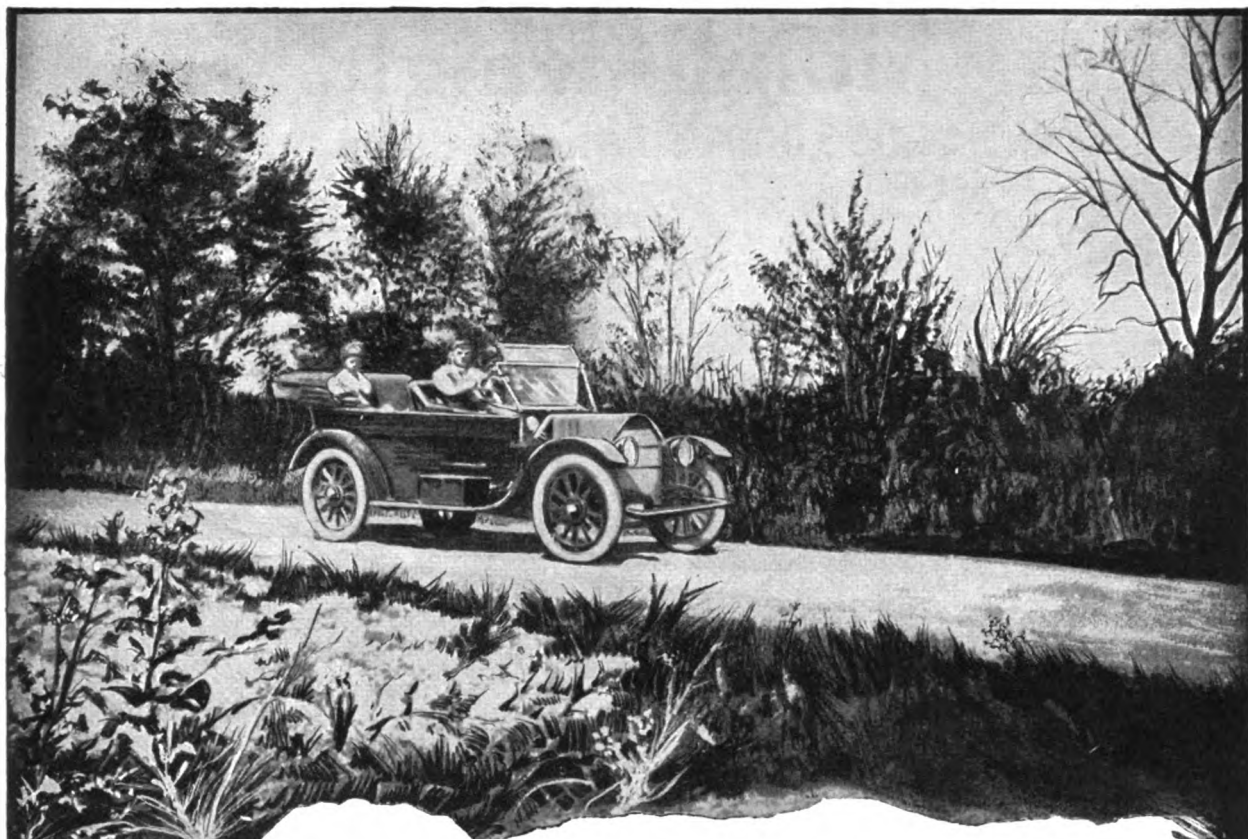
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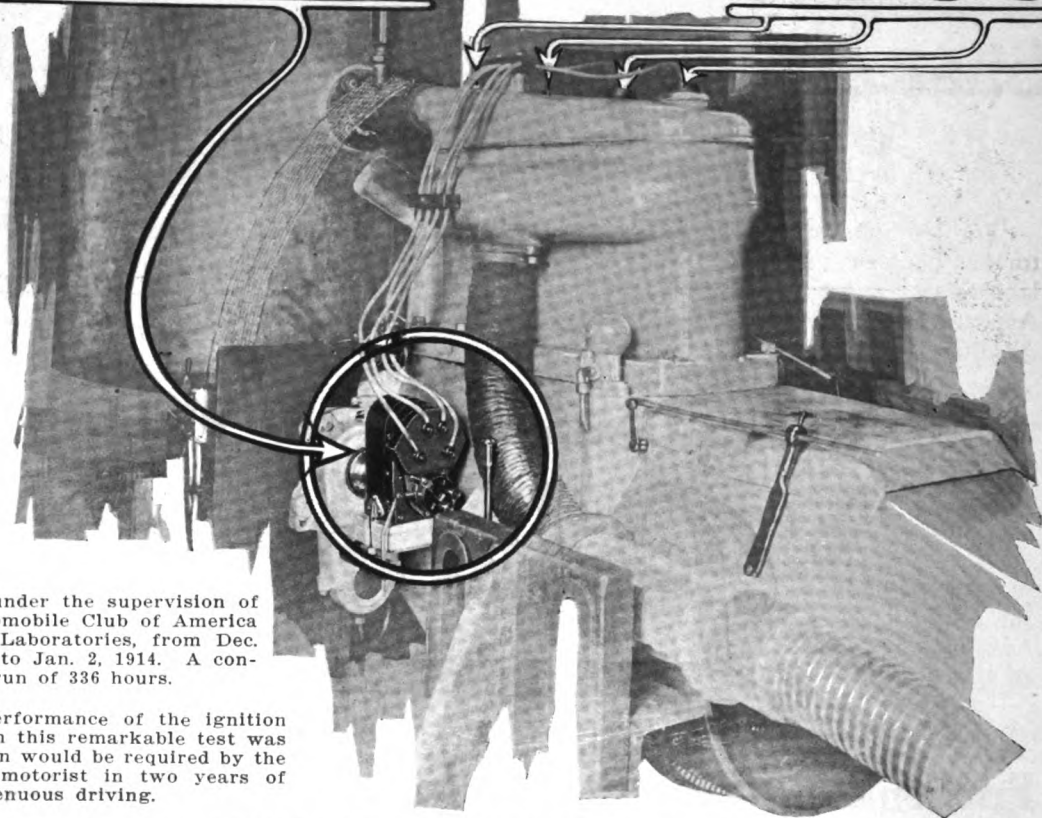


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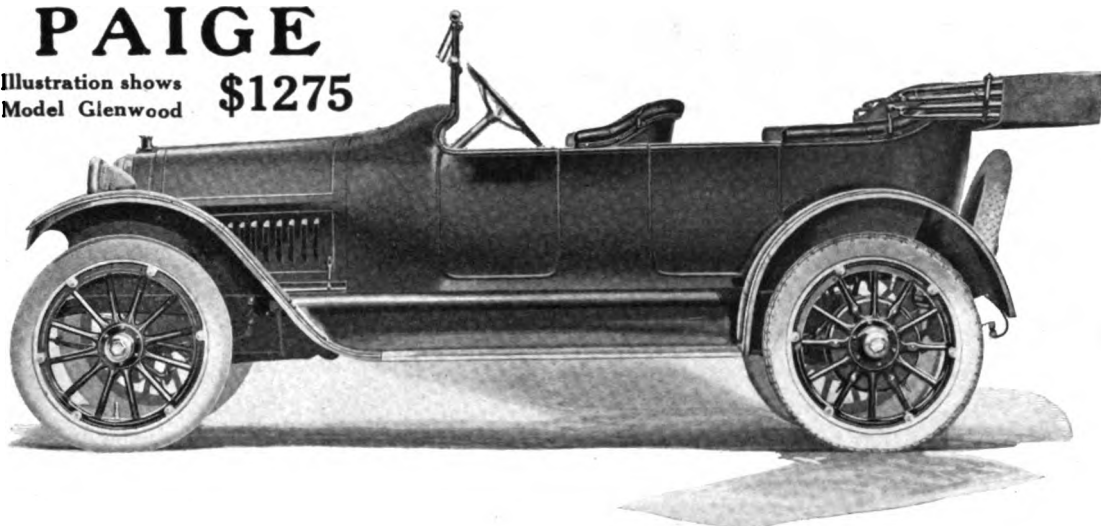
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**PAIGE**Illustration shows  
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## Paige—Mechanically A Marvelous Motor Car

For the year 1914 the Paige line of motor cars will still be without competition.

A year ago, when the Paige line was exhibited at the Automobile Shows, it was freely predicted by the wisecracks in the trade that the cars could never be manufactured and sold at the price—that either the prices must go up or the quality go down.

A careful comparison with the best competing makes showed Paige cars to be at least two to three hundred dollars underpriced.

But these predictions proved to be without foundation. The public took all of the Paige cars the factory could produce and called for more.

Now, the Paige 1914 line will show even greater extra value.

It will be even still further ahead of competition than ever.

Check over some of these improvements that have been made and you will realize why this must be so.

To the Glenwood has been added a beautiful, up-to-date streamline body. No finer appearing body is put on any car at any price.

The large unit Gray & Davis starting system will be used. No car at anywhere near the Paige price is provided with this equipment.

A genuine rain vision, bottom ventilating windshield has been added. The arrangement of the dash has been changed to make it still more convenient to the operator. The operation of the starter has been simplified—one shove of the foot plunger—that's all. A new 5-bow top is to be used.

Then think of the big Paige extra value features that will be continued.

The silent chain drive for the motor shafts. Cork insert multiple disc clutch. Bosch Magneto, etc.

Nowhere in the world is there a car made that combines these features with the beauty and mechanical

excellence of the Paige and sells at anywhere near Paige prices.

To the Paige "25" Brunswick has been added even more sensational improvements.

A complete electric lighting and starting system and a new up-to-date streamline body has been added and yet the price still remains under a thousand dollars. This is the first car ever made equipped with electric lighting and starting system and selling at so low a price.

From the standpoint of the dealer, one of the most attractive features of the Paige line is its completeness. Here you will find cars to meet every kind of service and every individual fancy.

On the Paige "36" chassis are mounted the Glenwood touring car body, the Westbrook roadster body, the Newport seven-passenger limousine and the Montrose four-passenger coupe. Besides these, a new body has been added to the line—the Speedway—a snappy, racy-looking roadster that looks the part of a racer better than any other car produced and yet combines this appearance with practically all of the comfort and convenience of a regular roadster body.

On the "25" chassis is mounted the Brunswick five-passenger touring car body and the Kenilworth three-passenger roadster body.

Dealers everywhere throughout the world realize that with their beauty, their mechanical excellence and their variety Paige cars are profitable to handle and that a Paige contract is an exceedingly valuable asset. There is some territory still open. For further information write or wire

## **PAIGE-DETROIT MOTOR CAR COMPANY,**

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# Why The Austin Is Superior

It is the only car with a **two-speed axle** and **six cylinder** motor. It also has the new "**Austin**" **hydraulic spring controllers** and many other special and exclusive features.

A careful study of the editorials and many statements showing the merits and many advantages of a **two-speed axle** also of a **six cylinder motor** will prove conclusively that a really **superior car** must have **both**.

With the **Austin two-speed axle** and **six cylinder** motor, the special high direct drive will be used most of the time for both city and country driving, the regular or low direct drive being desirable mostly for hills, bad roads and crowded traffic. This will not, normally, amount to over one-tenth the total travel.

**Long life and durability:** Austin cars have always been noteworthy for their long life and durability. While this has always been a very desirable feature, the rapid improvement in design and construction has, heretofore, eliminated much of its real value, as most owners of real high grade cars have sold their old cars (while mechanically as good as new) at a very material loss because they wanted the new and improved features of the later models.

We have, however, a sufficient number of owners who have used our cars continuously for many years at such a low cost for repair as to warrant the statement that the cars we are now building will give at least ten or twelve years of satisfactory service and at such a very low cost for operation and general upkeep as to make the total cost very much cheaper for that length of time than it would be for most any of the lower priced cars.

Having all the latest improvements now used on other cars, and many special and exclusive features obtainable only with the Austin, they are now so absolutely complete, in every desirable respect, that any future changes must be limited to details of minor importance. And it should be many years before the owner will feel any desire or inclination to make any change whatever.

The assurance of being able to use this car for so many years of satisfactory service, has now become of such great value as to warrant the extra initial cost of a car which is sure to give such complete satisfaction in every way.

**Personal supervision:** We have been making only strictly high grade cars for the past twelve years and limit our production to three cars per week. This enables us to give the necessary personal supervision to the details of construction, to assure the highest quality of workmanship and perfection in every feature, which would be impossible in a larger output. This also enables us to give special attention to the desires and requirements of each individual customer.

We will be pleased to answer any questions relative to the construction and merits of our special and exclusive features, and to give any further information that may be desired.

## AUSTIN AUTOMOBILE CO.

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# The Pioneer of the Past—and of the Future

**THE OLDEST**, and yet the newest car at the Automobile Show was the Maxwell "25."  
**NO NAME DATES FARTHER BACK** in this industry—and yet if you noticed where the crowd blocked the aisle, you'll agree that visitors considered the latest Maxwell—the "25-4"—the newest of them all.

**TO SAY** this \$750 car was the "sensation" of the 1914 Show would be trite—tho true. It is more than that.

**IT IS REVOLUTIONARY.**

**REVOLUTIONARY**, because, never before has it been possible to obtain a car of such size, such capacity, such power, such performance and of such quality throughout as you will see in this Maxwell "25" at the price—\$750 fully equipped.

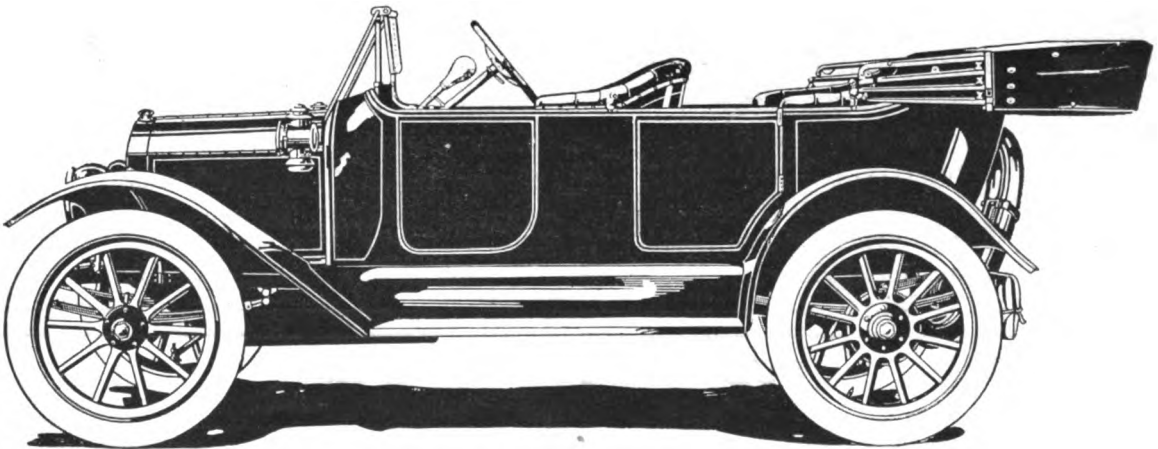
**REVOLUTIONARY, TOO, BECAUSE**, maintenance cost has been reduced to the minimum, by putting in this car the best steels known to science—thus making it light, yet practically indestructible. So you can now not only afford to buy, but to keep an automobile.

**WE CALL IT** an engineering triumph. And you'll agree we are justified when you recall that for years hundreds of thousands have been looking, hoping, waiting, for such a car at the price.

**WE SAY THIS CAR** was the Oldest car in the Show—because more years of experience; more combined engineering skill; more know-how have gone into it than ever went into any other automobile at the price.

**AND, BACKING UP** that experience; that skill; that know-how; is as much money as ever backed an automobile concern.

**ADD TO THIS**, honesty of purpose, pride, and a desire to make good and to deserve well at the hands of every owner—and you have the elements that combined have produced the car that was the wonder of the Show—that blocked the aisle in front of the exhibit and thereby proclaimed the Newest as well as the Oldest car in the Show. The Pioneer of the past—and of the future—the Maxwell "25."



**THE "25-4" TOURING CAR**

Everything you have a right to expect in an automobile. Ample leg room, seating capacity for 5 full grown adults. So light that it will cut down the tire bills, and strong enough to withstand all the rough usage you are going to give it. Stream-line body design, left hand steer and other features you look for in the highest priced car specifications. (Send for the Book.) Price \$750, fully equipped.

**Maxwell Motor Company, Inc.**  
**DEALERS AND SERVICE EVERYWHERE**  
**Detroit, Mich.**

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## PUBLISHERS' COMMENT.

**The Issue of The Automobile Journal for Jan. 25** will be a special Philadelphia number. Particular reference is made to the complete review of the Philadelphia automobile show, in connection with which will be presented interesting information relative to the conditions respecting the industry in that section as revealed by the dealers of the city. It will prove of decided interest as supplementing the other numbers in this series which already have appeared.

**New Owners and Prospective Purchasers**, particularly those who are interested in small cars, will find the suggestions in the department devoted to the care and maintenance of these machines particularly valuable during the coming year. The subjects treated will be those which most often cause trouble for the novice, and every effort will be made in the preparation of the discussions to deal with the matter in simple, non-technical language, readily understood by those who are not mechanically versed.

**The Importance of Accessory Equipment** was never better demonstrated than during the New York show. Readers of The Automobile Journal were able to appreciate the value of the different products displayed through the intimate knowledge of the various supplies, parts and fittings gained by carefully following the special New Accessory Department, which appears in each issue of this magazine. Particular attention is directed to page 32 in this issue, as indicating the manner in which these new products will be handled during 1914.

**The Buyers' Guide on Pages 87-96** contains the names and addresses of reliable concerns engaged in the manufacture and sale of pleasure and commercial cars, their accessories, parts and fittings, and should always be consulted when in need of anything new.

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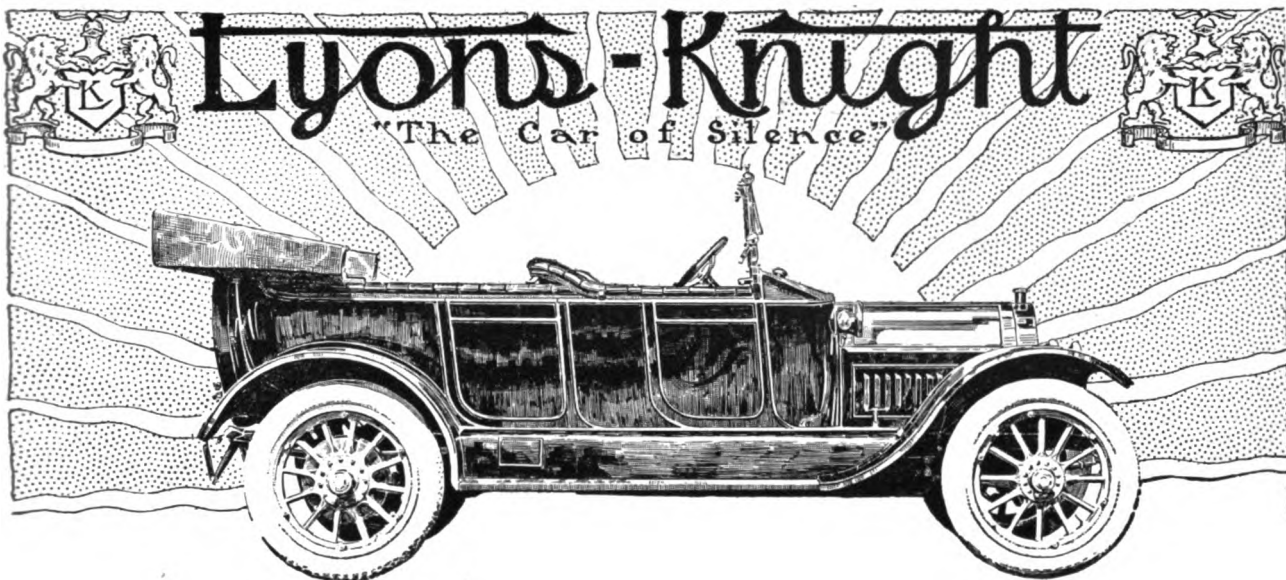
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# The Dawn of a New Era!

WITH the New Year of 1914, comes a new era in motordom. For twenty years the automobile has passed through the experimental stages in design—in materials—in methods of manufacture—in sales and in service. Now comes the Lyons-Knight as the first car of a new era. Because of its many better features it is important that you see and know its value before you buy *any* car. Here are reasons:

## A Great Change for the Better

The automobile industry has worked toward this great change for years. The history of other automobile factories proves it. The million motorists of America have learned to know the features that go to make automobile value.

One group of men, backed by ample capital, foresaw this change. They secured one of the greatest manufacturing institutions of America. They brought to their organization the most experienced engineers and production managers. For two years they studied to produce the car to satisfy the experienced motorist. They designed and erected machinery to construct such a car. They anticipated the dawn of the new era.

The result is the Lyons-Knight—a car that is different and better than any other high class car.

This car is backed by a service—by a broad-gauge, business-like sales policy that has secured the finest dealers from the old days of the automobile.

This great, new, live, strong, aggressive organization ushers in the first car of the new era.

## What the Lyons-Knight Proves

"The Car of Silence" is proof of this new era in automobile design, manufacture and value. One ride in it will convince you that its makers have produced something different and better.

The Lyons-Knight is no more a 1914 car than it is a 1918 car or a 1924 car. So staunchly and truly is it built that years of use but make its operation smoother and more efficient.

The lines of the bodies are such that this car will be a standard for years to come. Nothing radical this year or next—always pleasing and up-to-date.

The Lyons-Knight engine is the finest power plant ever placed in any American car. Its makers guarantee its performance to surpass that of any four-cylinder poppet-valve engine of equal size—to surpass a six-cylinder poppet-valve engine of larger size even in the points of

smoothness and flexibility as well as power.

Worm drive brings to this big 130-inch wheel base car an added smoothness and balance—freedom from vibration and sounds the death note of the grinding gears which marked the finest cars of the old era.

Point after point adds to the proofs that this car is representative of a new order.

## Before You Buy

You will find the great, growing, multiplying Lyons-Knight organization reaching out over the entire country. Its representative in your city is one of the most experienced men you can find. He will put you in touch with the new era in motordom that means greater value out of every dollar you invest.

Lyons-Knight cars will be on display at the Chicago Automobile Show.

Full information about the great organization and descriptions of the cars themselves will be mailed you on request.

Know about them—before you buy.

**Lyons-Knight K-4**  
**Five Passenger**  
**Touring \$2900**  
**Car . . \$2900**

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**INDIANAPOLIS, INDIANA**

**Lyons-Knight K-4**  
**Seven Passenger**  
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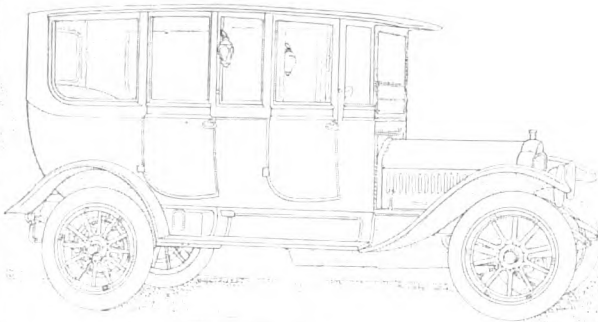




## Alone

For its absolute correctness of construction, for the perfect control and noiselessness of its power, for its inspiring dignity of appearance, and for the studied attention to every smallest detail that provides complete comfort and relaxation, the White Berline stands unequalled.

THE WHITE  COMPANY  
CLEVELAND



*Venus persuades Apollo to abandon his sun chariot for the White Berline.*

— Otto Cushing

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# THE AUTOMOBILE JOURNAL

VOL. XXXVI, No. 11

JANUARY 10, 1913

Price, \$1.00 the Year

## NEW YORK SHOW A SPLENDID SUCCESS.

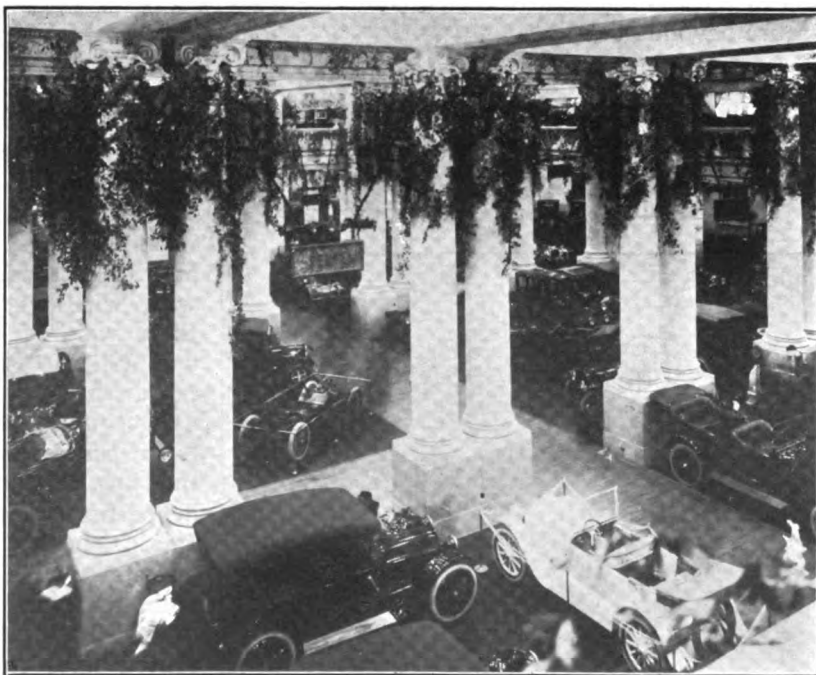
**Attendance Larger Than at Any Previous Display in That City--Comprehensive Exhibit of Cars and Accessories Representative of the Industry's Progress.**

**A**CCORDING to the statements issued by those in charge of box office receipts, the number of paid admissions to the 14th annual national New York automobile show in the Grand Central Palace was larger each day than for any corresponding day of any previous display held in that city. This would seem to indicate that the interest in motor cars and their equipment is by no means at low ebb. And those who visited the exhibition were privileged to witness one of the most comprehensive displays of cars and accessories yet held in New York City.

Grand Central Palace possesses certain very obvious disadvantages over Madison Square Garden as a place in which to hold a show of this character. The crowds which visited the building were most largely distributed over the two

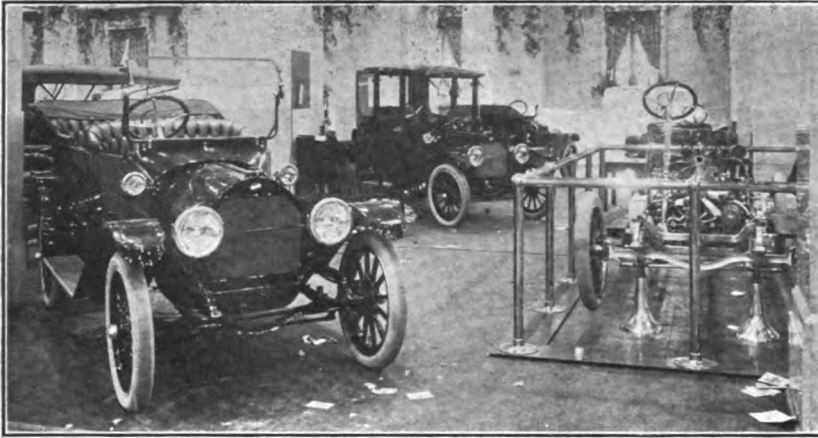
lower floors. The accessories and supplies were all displayed on the third and fourth floors, and, despite the presence on these floors of numerous cars, cyclecars and motorcycles, the number of visitors was much smaller in comparison, with the single exception of Thursday, which saw the largest attendance of the week.

No attempt



**General View of Main Floor in Grand Central Palace During the Progress of the New York Show.**



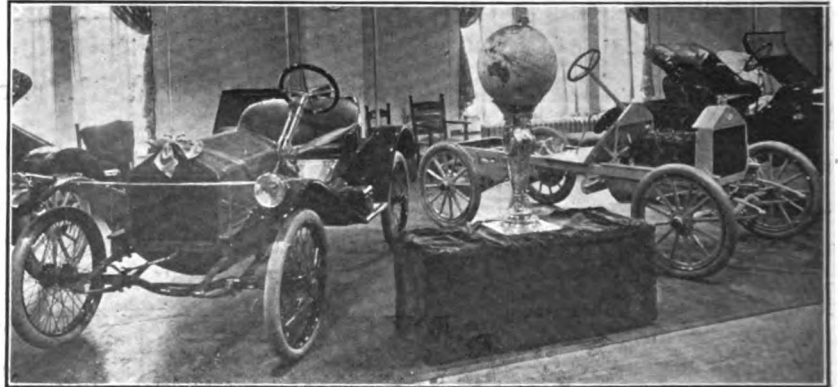


Overland Cars and Stripped Chassis Grouped in Front of Main Entrance.

will be made here to discuss the different exhibits in detail. It is sufficient to state that there was quite as much of interest to motorists and prospective purchasers among the accessory displays as was shown on the cars themselves. Those who failed to visit these booths missed an exceedingly important portion of the exhibition. The products of the various makers could be displayed much more advantageously than in the basement at Madison Square Garden, but for some unaccountable reason many visitors declined to venture beyond that second floor.

Grand Central Palace does not permit of the elaborate decorative schemes for which the New York shows have been noted, but the show committee, composed of Col. George Pope, W. C. Leland and H.

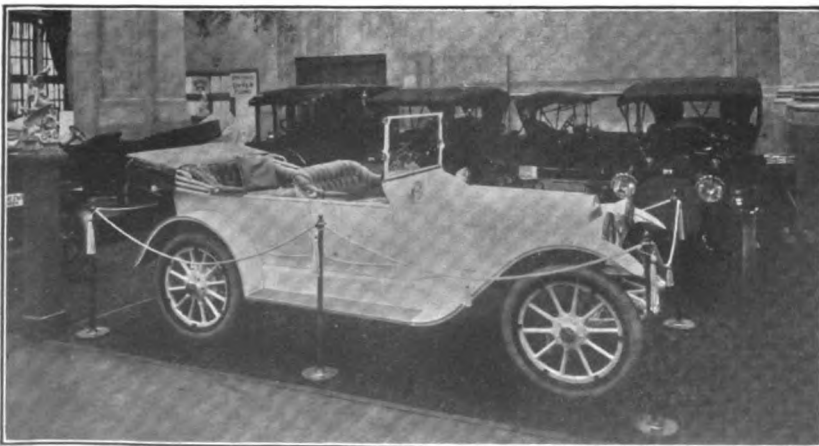
considered elsewhere. In one respect there was failure to meet the prophecies of a year ago, when it was insistently proclaimed that the 1914 show



The Glidden Trophy Occupied the Centre of the Metz Display.

would find a majority of the cars fitted with wire wheels. Eighty-five makes of machines were represented in Madison Square Garden and Grand Central Palace in 1913, and 11 of these were equipped with wire wheels. This year there were 75 different makes, and 19 were fitted with this type.

Accompanying tables set forth certain facts concerning the show, and present some evidence respecting the motor situation. Last year there were 49 makers who displayed six-cylinder machines and 64 who exhibited fours. Of these, 18 presented sixes only and 36 fours only. This year there were 48 exhibitors of sixes and 54 of



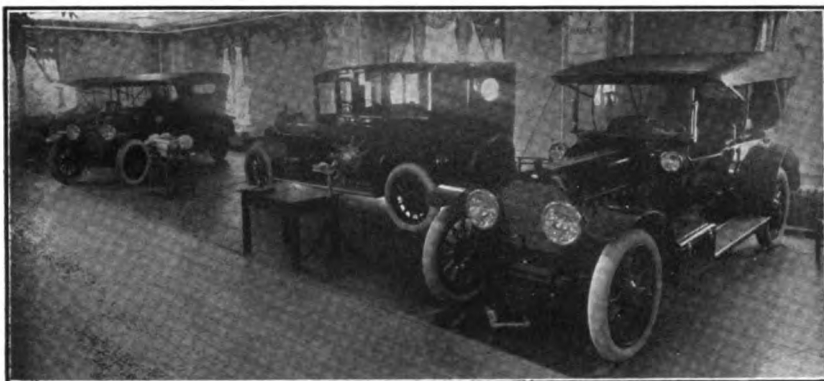
The Vette Exhibit Featured a Touring Car Finished in White.



fours, of which 20 displayed sixes only and 28 fours only. There were 26 makers who exhibited last year who were not represented this, and 15 manufacturers made display this year who did not last. Eight of those who exhibited fours exclusively in 1913 have added a six this year, while one maker of sixes exclusively a year ago has added a four, and another has dropped the six and taken up the four. Insofar as the two

New York shows are concerned, therefore, it would appear that the advocates of the six-cylinder motor had made a substantial gain.

Makes of cars not shown last year included

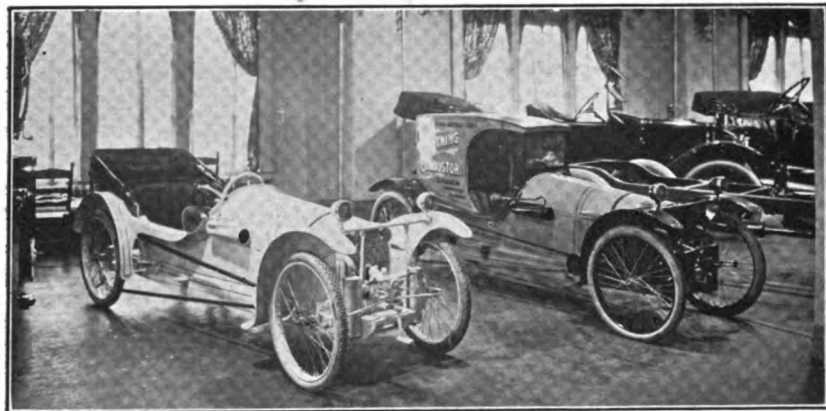


Where the Marmon Line Was Displayed on the Second Floor.

er are not new makes at a New York show, and the same holds true in a measure of the Crescent, which is a new name for the old Ohio gasoline car. The Cameron has been made for a number of years, but this was its first appearance with a water-cooled motor. Several other makes were represented by new models, in some of which there was little change from previous design, while there was a radical departure with a few.

One of the most interesting features, in connection with the gasoline machines, was the use of non-poppet valve motors. The first appearance of the Knight in a New York show was in 1912, when the Stearns, Columbia and Stoddard-Dayton

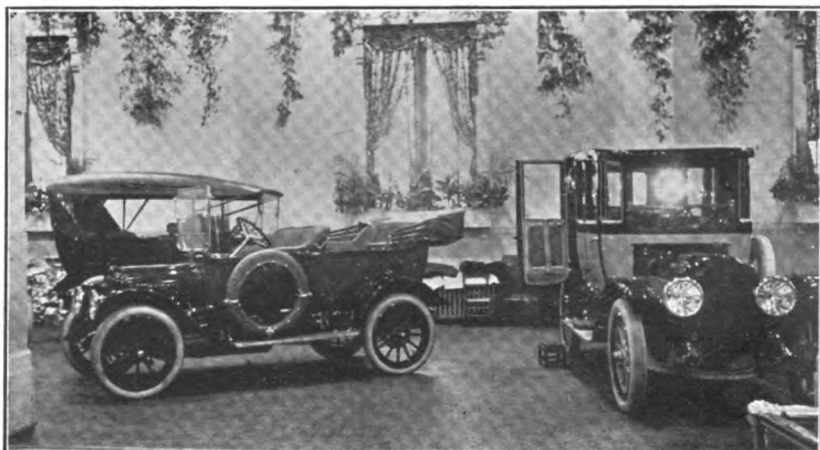
were presented. Last year, the number was increased to four by the addition of the Edwards, and the Speedwell's rotary valve model made the total non-poppet designs five. The Columbia



Two Members of the Imp Family in the Cyclecar Division.

the following: Allen, Apperson, Briscoe, Cameron, Car-Nation, Chandler, Crescent, Great Western, Lyons-Knight, McIntyre, Metropal, Palmer-Singer, Partin-Palmer, Saxon and Vulcan. The Willys-Knight practically was new in name only, since it was shown last year under the name of Edwards-Knight. This compilation does not include the car shown at the booth of the Fischer Motor Corporation, which was stated to be a body of special construction, presented solely for the purpose of calling attention to the Magic motor, made by this company and installed as regular equipment in one of the Palmer-Singer models.

The Apperson, Great Western, McIntyre and Palmer-Sing-



White Cars Were Shown in a Simple and Attractive Setting.





**The Vacuum Mobiloil Booth Transplanted from the Paris Salon.**

and Stoddard-Dayton are no longer being produced, and the Edwards has become the Willys. This year, however, the number of makes fitted with non-poppet valve motors was increased to seven, as follows: Stearns, Willys, Lyons and Moline with the Knight; Speedwell with its rotary valve type, Palmer-Singer with the Magic, and Great Western with the Carter piston valve design. This list does not include the car at the Fischer Motor Corporation's booth for the reason stated above. Several other new motors, of the poppet valve type, also were shown, as pointed out in detail elsewhere.

For the most part, however, it continues to be true that automobile construction may be regarded as conventional and standardized to a certain degree. The greatest difference between the models produced this year by a majority of the concerns and those shown a year ago was to be found in the body lines and the nature of the equipment. Two makes featured the electric gearshift—the Haynes and the Pullman—and two the two-speed rear axle—the Austin and the Cadillac. The use of electric starting is even more general than a year ago, as was to be expected from the announcements made during the year. Other new features are discussed fully in another place.

Special show bodies were by no means as numerous as in other years, although there were several interesting examples of the coach maker's art among the exhibits of the gasoline car makers. The electric vehicle section was particularly noticeable in this respect, how-

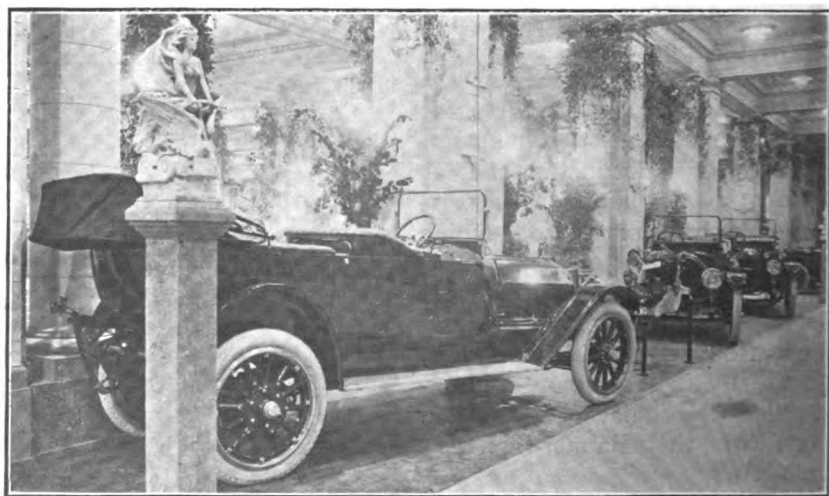
ever. The number of makes on display was but six, as follows: Baker, Detroit, Ohio, Rauch & Lang, Ward and Waverley. Of these, the Ward is entirely new.

Four models of the Baker were shown, one of these being finished in green and another in taupe, with gray and old rose trimmings. The Detroit also was represented by four models. The Ohio presented three coupes and a chassis, the Rauch & Lang two closed cars, and the Ward, a coupe and chassis. The Waverley exhibited three of its

models, one of which was finished in gold leaf, one side being removed to direct special attention to the interior seating arrangement.

An entirely new feature this year was the cyclocar section, although the number of exhibits in this division was by no means as large as had been expected. There were but five makes on display—Car-Nation, Imp, LaVigne, Trumbull and Twombly, although the Zip came over the road from Chicago and virtually was represented at the show during the last few days of the week. An Imp machine also was driven over the road from Detroit. Each of these machines was surrounded by a crowd of interested people a large portion of the time.

If the Zip be included, there were four makes shown with four-cylinder motors and two with two. In the former class were the Car-Nation, LaVigne, Trumbull and Twombly, while the Imp and Zip were in the latter. It will be noted that the name Car-Nation also appears in the



**Looking Down One of the Main Aisles, Jackson in the Foreground.**



## GASOLINE CARS DISPLAYED AT NEW YORK SHOW.

|                | Four-Cylinder |          |          |           | Six-Cylinder |          |          |           |                     | Four-Cylinder |          |          |           | Six-Cylinder |          |          |           |
|----------------|---------------|----------|----------|-----------|--------------|----------|----------|-----------|---------------------|---------------|----------|----------|-----------|--------------|----------|----------|-----------|
|                | Touring.      | Roadster | Enclosed | Chassis.. | Touring.     | Roadster | Enclosed | Chassis.. |                     | Touring.      | Roadster | Enclosed | Chassis.. | Touring.     | Roadster | Enclosed | Chassis.. |
| Abbott-Detroit | 1             | ..       | 1        | ..        | 1            | 1        | ..       | ..        | Marion              | 1             | ..       | 1        | ..        | 1            | 1        | 1        | ..        |
| Allen          | 1             | 1        | ..       | 1         | ..           | ..       | ..       | ..        | Marmon              | 1             | ..       | ..       | ..        | 1            | ..       | 1        | ..        |
| Apperson       | 1             | 1        | ..       | ..        | 1            | ..       | ..       | ..        | Maxwell             | 2             | 1        | 1        | 1         | ..           | ..       | ..       | ..        |
| Auburn         | 1             | ..       | ..       | ..        | 1            | ..       | ..       | ..        | Merced              | ..            | 2        | 1        | 1         | ..           | ..       | ..       | ..        |
| Briscoe        | 1             | ..       | ..       | 1         | ..           | ..       | ..       | ..        | Metropol            | ..            | ..       | ..       | 1         | ..           | ..       | ..       | ..        |
| Buick          | 1             | 1        | ..       | ..        | 1            | ..       | ..       | ..        | Metz                | ..            | 3        | ..       | 1         | ..           | ..       | ..       | ..        |
| Cadillac       | ..            | 1        | 4        | 1         | ..           | ..       | ..       | ..        | Mitchell            | 1             | ..       | ..       | ..        | 1            | ..       | ..       | 1         |
| Cameron        | 1             | ..       | 1        | 1         | ..           | ..       | ..       | ..        | Moline-Knight       | 1             | ..       | ..       | ..        | ..           | ..       | ..       | ..        |
| Car-Nation     | 1             | ..       | ..       | ..        | ..           | ..       | ..       | ..        | Moon                | ..            | 1        | ..       | ..        | 1            | ..       | ..       | 1         |
| Cartercar      | 2             | 1        | 2        | 1         | ..           | ..       | ..       | ..        | National            | 1             | 1        | ..       | ..        | 1            | ..       | 1        | ..        |
| Case           | 3             | ..       | ..       | 1         | ..           | ..       | ..       | ..        | Oakland             | 2             | 2        | ..       | ..        | 1            | ..       | 2        | ..        |
| Chalmers       | ..            | ..       | ..       | ..        | 3            | ..       | 1        | 1         | Oldsmobile          | ..            | ..       | ..       | ..        | 2            | ..       | ..       | ..        |
| Chandler       | ..            | ..       | ..       | ..        | 1            | 1        | 2        | 1         | Overland            | 1             | 2        | 1        | 1         | ..           | ..       | ..       | ..        |
| Cole           | 1             | 1        | 1        | ..        | 1            | 1        | 1        | 1         | Packard             | ..            | ..       | ..       | ..        | 1            | ..       | 2        | 1         |
| Crescent       | 1             | ..       | ..       | ..        | 1            | ..       | ..       | 1         | Palge               | 2             | 2        | 2        | ..        | ..           | ..       | ..       | ..        |
| Davis          | 1             | ..       | ..       | ..        | 3            | ..       | ..       | ..        | Palmer-Singer       | ..            | ..       | ..       | ..        | 1            | ..       | ..       | 1         |
| Detroit        | 2             | 1        | ..       | 1         | ..           | ..       | ..       | ..        | Palmer-Singer-Magic | ..            | ..       | ..       | ..        | 1            | ..       | ..       | ..        |
| Empire         | 2             | 1        | ..       | ..        | ..           | ..       | ..       | ..        | Partin-Palmer       | 1             | ..       | ..       | 1         | ..           | ..       | ..       | ..        |
| Flat           | ..            | 1        | 1        | ..        | 1            | ..       | ..       | 1         | Pathfinder          | ..            | 1        | ..       | ..        | 2            | ..       | 1        | 1         |
| Franklin       | ..            | ..       | ..       | ..        | 1            | 1        | 2        | ..        | Peerless            | ..            | ..       | ..       | ..        | 2            | ..       | 2        | ..        |
| Great Western  | ..            | 1        | ..       | 1         | ..           | ..       | ..       | ..        | Pierce-Arrow        | ..            | ..       | ..       | ..        | 1            | 1        | 1        | 1         |
| Havers         | ..            | ..       | ..       | ..        | 2            | 2        | ..       | ..        | Pope-Hartford       | 1             | ..       | 1        | ..        | ..           | ..       | ..       | ..        |
| Haynes         | ..            | ..       | ..       | ..        | 2            | 1        | 1        | ..        | Premier             | ..            | ..       | ..       | ..        | 1            | 1        | ..       | 1         |
| Henderson      | 1             | ..       | 1        | ..        | ..           | 1        | ..       | ..        | Pullman             | 1             | ..       | ..       | ..        | 2            | 1        | ..       | ..        |
| Herrshoff      | 1             | ..       | ..       | ..        | 1            | ..       | ..       | ..        | Regal               | 2             | 1        | 1        | ..        | ..           | ..       | ..       | ..        |
| Hudson         | ..            | ..       | ..       | ..        | 2            | 1        | 2        | ..        | Reo                 | 1             | 1        | ..       | 1         | ..           | ..       | ..       | ..        |
| Hupmobile      | 2             | 1        | 1        | 1         | ..           | ..       | ..       | ..        | Saxon               | ..            | 1        | ..       | ..        | ..           | ..       | ..       | ..        |
| Imperial       | 2             | ..       | ..       | ..        | 2            | ..       | ..       | ..        | Speedwell           | ..            | ..       | ..       | ..        | 1            | ..       | ..       | 1         |
| Jackson        | 2             | ..       | ..       | ..        | 1            | ..       | ..       | ..        | Stearns-Knight      | 1             | ..       | 1        | ..        | 1            | ..       | ..       | ..        |
| Jeffery        | 1             | ..       | 1        | 1         | 1            | 1        | ..       | ..        | Stevens-Duryea      | ..            | ..       | ..       | ..        | 1            | ..       | 2        | ..        |
| Keeton         | ..            | ..       | ..       | ..        | 1            | ..       | 1        | ..        | Studebaker          | 1             | 1        | ..       | ..        | 1            | 1        | 1        | ..        |
| King           | 1             | 1        | ..       | 1         | ..           | ..       | ..       | ..        | Stutz               | 1             | 1        | ..       | ..        | ..           | 1        | ..       | 1         |
| Kissel-Kar     | ..            | ..       | ..       | ..        | 3            | 1        | ..       | 1         | Velle               | 1             | 1        | ..       | ..        | 1            | ..       | ..       | ..        |
| Kline-Kar      | 1             | ..       | 1        | ..        | 2            | ..       | ..       | ..        | Vulcan              | ..            | 1        | ..       | 1         | ..           | ..       | ..       | ..        |
| K-R-I-T        | 2             | 1        | ..       | ..        | ..           | ..       | ..       | ..        | White               | 2             | 1        | 1        | ..        | 1            | ..       | 1        | ..        |
| Locomobile     | ..            | ..       | ..       | ..        | 1            | ..       | 2        | 1         | Willys-Knight       | 1             | ..       | 1        | ..        | ..           | ..       | ..       | ..        |
| Lozier         | 1             | 1        | ..       | 1         | 1            | ..       | ..       | ..        | Winton              | ..            | ..       | ..       | ..        | 2            | ..       | 1        | ..        |
| Lyons-Knight   | 2             | ..       | 2        | ..        | ..           | ..       | ..       | ..        | Total               | 61            | 37       | 26       | 20        | 62           | 17       | 28       | 16        |
| McIntyre       | ..            | ..       | ..       | ..        | 1            | ..       | ..       | ..        |                     |               |          |          |           |              |          |          |           |

list of automobiles. This machine is made in three models, two of which seat two passengers and the third four. The last named is styled a touring car, and while it is difficult to classify cyclecars, the distinction in this instance has been made in the matter of tread, and both of the two-passenger machines of this make have tread of 48 inches. However, only one of the cyclecar models was displayed.

Considering only those models on exhibit, the makes were evenly divided as to seating arrangement, Car-Nation, Imp and Twombly being shown as tandem machines and the LaVigne, Trumbull and Zip with seats side by side. All of these have been described in these columns, but it is of interest to note that the Twombly is now made in the four-cylinder model only, as model C, utilizing the Twombly piston valve motor originally installed in the model B.

In some respects it almost might be said that the show was an accessory display, for it is true that the equipment on the cars played an important part in that division, and the exhibition

of accessories, supplies and fittings by concerns in that field was most complete in every detail. There were a large number of new things at the spaces on the two upper floors, and for this reason the accessory division was even more interesting than in previous years.

The Bosch Magneto Company, New York City, is calling special attention to the performance of the Bosch magneto and plugs utilized on the Moline-Knight engine, a report concerning the test of which appears elsewhere in these pages. Advertising Manager A. H. Bartsch has done some figuring in this connection and finds that during the 336-hour test over 44,352,000 sparks were produced by the magneto and 11,088,000 sparks passed across the electrodes of each of the four plugs. It took 88,704,000 separate movements of the magneto contact breaker to produce these sparks. The official report says that the regularity of the firing was notable throughout. None of the plugs was disturbed or adjusted during the test.



# MOTOR SITUATION AS REVEALED BY NEW YORK SHOW.

## FOUR-CYLINDER MOTORS.

|                | Type    | Cast   | Bore  | Stroke | Ratio  |
|----------------|---------|--------|-------|--------|--------|
| Abbott-Detroit | L head  | block  | 4.500 | 5.50   | 1:1.22 |
| Allen          | L head  | block  | 4.125 | 5.00   | 1:1.21 |
| Apperson       | T head  | singly | 4.500 | 5.00   | 1:1.11 |
| Auburn         | T head  | block  | 4.500 | 5.00   | 1:1.11 |
| Briscoe        | L head  | block  | 3.200 | 5.12   | 1:1.60 |
| Bulck          | in head | pairs  | 3.750 | 3.75   | 1:1.00 |
| Bulck          | in head | pairs  | 3.750 | 5.00   | 1:1.33 |
| Cadillac       | L head  | singly | 4.500 | 5.75   | 1:1.28 |
| Cameron        | in head | block  | 3.625 | 5.00   | 1:1.39 |
| Car-Nation     | L head  | block  | 3.375 | 3.75   | 1:1.11 |
| Cartercar      | L head  | block  | 3.500 | 5.00   | 1:1.43 |
| Cartercar      | L head  | pairs  | 4.125 | 4.75   | 1:1.15 |
| Case           | T head  | pairs  | 3.750 | 4.75   | 1:1.27 |
| Case           | T head  | pairs  | 4.250 | 5.50   | 1:1.29 |
| Case           | T head  | pairs  | 4.500 | 5.25   | 1:1.17 |
| Cole           | L head  | pairs  | 4.250 | 5.25   | 1:1.23 |
| Crescent Ohio  | T head  | block  | 4.250 | 4.75   | 1:1.12 |
| Davis          | L head  | block  | 3.500 | 5.00   | 1:1.43 |
| Detroit        | L head  | block  | 3.500 | 5.00   | 1:1.43 |
| Empire         | L head  | pairs  | 3.750 | 5.00   | 1:1.33 |
| Fiat           | L head  | block  | 4.375 | 6.00   | 1:1.37 |
| Fiat           | L head  | block  | 5.125 | 7.50   | 1:1.46 |
| Great Western  | L head  | singly | 4.250 | 5.50   | 1:1.29 |
| Great Western  | Carter  | block  | 3.750 | 5.75   | 1:1.53 |
| Henderson      | L head  | block  | 4.125 | 5.50   | 1:1.21 |
| Herreshoff     | L head  | block  | 3.375 | 4.50   | 1:1.33 |
| Hupmobile      | L head  | block  | 3.250 | 5.50   | 1:1.66 |
| Imperial       | L head  | block  | 4.250 | 5.25   | 1:1.23 |
| Imperial       | L head  | pairs  | 4.500 | 5.00   | 1:1.11 |
| Jackson        | L head  | pairs  | 4.125 | 4.75   | 1:1.15 |
| Jackson        | L head  | pairs  | 4.500 | 5.25   | 1:1.17 |
| Jeffery        | L head  | block  | 3.750 | 5.25   | 1:1.40 |
| King           | L head  | block  | 3.875 | 5.00   | 1:1.29 |
| Kline-Kar      | T head  | pairs  | 4.312 | 5.75   | 1:1.33 |
| K-R-I-T        | L head  | block  | 3.750 | 4.00   | 1:1.07 |
| Kozler         | L head  | block  | 4.250 | 6.50   | 1:1.52 |
| Lyons-Knight   | Knight  | pairs  | 4.500 | 5.50   | 1:1.22 |
| Marion         | L head  | pairs  | 4.000 | 5.00   | 1:1.25 |
| Marmon         | T head  | pairs  | 4.500 | 5.00   | 1:1.11 |
| Maxwell        | L head  | block  | 3.625 | 4.50   | 1:1.29 |
| Maxwell        | L head  | block  | 4.000 | 4.75   | 1:1.19 |
| Mercer         | T head  | pairs  | 4.500 | 5.00   | 1:1.11 |
| Metropol       | T head  | block  | 4.250 | 7.87   | 1:1.85 |
| Metz           | L head  | block  | 3.750 | 4.00   | 1:1.07 |
| Mitchell       | T head  | pairs  | 4.250 | 7.00   | 1:1.65 |
| Moline-Knight  | Knight  | block  | 4.000 | 6.00   | 1:1.50 |
| Moon           | T head  | pairs  | 4.500 | 5.00   | 1:1.11 |
| National       | T head  | pairs  | 4.875 | 6.00   | 1:1.23 |
| Oakland        | L head  | block  | 3.500 | 5.00   | 1:1.43 |
| Oakland        | L head  | pairs  | 4.250 | 5.25   | 1:1.23 |
| Overland       | L head  | singly | 4.125 | 4.50   | 1:1.09 |
| Paige          | L head  | block  | 3.750 | 4.00   | 1:1.07 |
| Paige          | L head  | block  | 4.000 | 5.00   | 1:1.25 |
| Partin-Palmer  | in head | block  | ...   | ...    | ...    |
| Pathfinder     | L head  | block  | 4.125 | 5.25   | 1:1.27 |
| Pullman        | T head  | pairs  | 4.063 | 5.00   | 1:1.23 |
| Regal          | L head  | block  | 4.000 | 5.00   | 1:1.25 |
| Regal          | L head  | block  | 3.750 | 4.50   | 1:1.20 |
| Reo            | L head  | pairs  | 4.000 | 4.50   | 1:1.12 |
| Saxon          | L head  | block  | 2.625 | 4.00   | 1:1.52 |
| Stearns-Knight | Knight  | pairs  | 4.250 | 5.50   | 1:1.29 |
| Studebaker     | L head  | block  | 3.500 | 5.00   | 1:1.43 |
| Stutz          | T head  | pairs  | 4.750 | 5.50   | 1:1.16 |
| Velle          | L head  | pairs  | 4.000 | 5.00   | 1:1.25 |

|               |        |       |       |      |        |
|---------------|--------|-------|-------|------|--------|
| Velle         | L head | pairs | 4.625 | 5.25 | 1:1.14 |
| Vulcan        | L head | block | 3.375 | 5.00 | 1:1.48 |
| White         | L head | block | 3.750 | 5.12 | 1:1.28 |
| White         | L head | block | 4.250 | 6.37 | 1:1.49 |
| Willys-Knight | Knight | pairs | 4.000 | 5.50 | 1:1.35 |

## SIX-CYLINDER MOTORS.

|                |         |        |       |      |        |
|----------------|---------|--------|-------|------|--------|
| Abbott-Detroit | L head  | threes | 4.125 | 5.25 | 1:1.27 |
| Apperson       | L head  | block  | 3.750 | 5.50 | 1:1.47 |
| Auburn         | L head  | pairs  | 3.750 | 5.25 | 1:1.40 |
| Bulck          | in head | pairs  | 3.750 | 5.00 | 1:1.33 |
| Chalmers       | T head  | threes | 3.500 | 5.50 | 1:1.57 |
| Chalmers       | T head  | threes | 4.000 | 5.50 | 1:1.37 |
| Chandler       | L head  | threes | 3.375 | 5.00 | 1:1.47 |
| Cole           | L head  | pairs  | 4.250 | 5.25 | 1:1.23 |
| Crescent Royal | T head  | block  | 4.000 | 6.00 | 1:1.50 |
| Davis          | L head  | threes | 3.500 | 5.00 | 1:1.43 |
| Fiat           | L head  | block  | 4.375 | 6.00 | 1:1.37 |
| Franklin       | in head | singly | 3.625 | 4.00 | 1:1.10 |
| Havers         | L head  | pairs  | 3.750 | 5.00 | 1:1.33 |
| Havers         | L head  | pairs  | 4.125 | 5.25 | 1:1.27 |
| Haynes         | L head  | pairs  | 4.250 | 5.50 | 1:1.29 |
| Henderson      | L head  | block  | 3.750 | 5.50 | 1:1.47 |
| Herreshoff     | T head  | block  | 3.375 | 4.50 | 1:1.33 |
| Hudson         | L head  | threes | 4.125 | 5.25 | 1:1.27 |
| Imperial       | L head  | threes | 3.750 | 5.25 | 1:1.40 |
| Jackson        | L head  | pairs  | 4.125 | 4.75 | 1:1.15 |
| Jeffery        | L head  | pairs  | 3.750 | 5.25 | 1:1.40 |
| Keeton         | L head  | block  | 4.000 | 5.00 | 1:1.25 |
| KisselKar      | L head  | block  | 3.750 | 5.50 | 1:1.47 |
| KisselKar      | L head  | pairs  | 4.500 | 5.25 | 1:1.17 |
| Kline-Kar      | T head  | pairs  | 4.125 | 5.50 | 1:1.33 |
| Kline-Kar      | T head  | pairs  | 4.312 | 5.75 | 1:1.33 |
| Locomobile     | T head  | pairs  | 4.250 | 5.00 | 1:1.19 |
| Locomobile     | T head  | pairs  | 4.500 | 5.50 | 1:1.22 |
| Lozier         | L head  | threes | 3.875 | 5.50 | 1:1.42 |
| McIntyre       | T head  | block  | 3.500 | 4.50 | 1:1.29 |
| Marion         | L head  | threes | 3.750 | 5.25 | 1:1.40 |
| Marmon         | L head  | threes | 4.125 | 5.50 | 1:1.33 |
| Marmon         | T head  | pairs  | 4.500 | 6.00 | 1:1.30 |
| Mitchell       | T head  | pairs  | 4.250 | 7.00 | 1:1.64 |
| Moon           | L head  | threes | 3.750 | 5.25 | 1:1.40 |
| National       | L head  | block  | 3.750 | 5.50 | 1:1.47 |
| Oakland        | L head  | pairs  | 4.125 | 4.75 | 1:1.15 |
| Oakland        | L head  | block  | 3.500 | 5.00 | 1:1.43 |
| Oldsmobile     | L head  | pairs  | 4.250 | 5.25 | 1:1.23 |
| Packard        | L head  | threes | 4.000 | 5.50 | 1:1.37 |
| Palmer-Singer  | T head  | threes | 4.000 | 5.50 | 1:1.37 |
| Palmer-Singer  | Magic   | threes | 4.000 | 5.00 | 1:1.25 |
| Pathfinder     | L head  | threes | 4.125 | 5.25 | 1:1.27 |
| Peerless       | T head  | pairs  | 4.000 | 5.50 | 1:1.37 |
| Peerless       | T head  | pairs  | 4.500 | 6.00 | 1:1.50 |
| Peerless       | T head  | pairs  | 5.000 | 7.00 | 1:1.40 |
| Pierce-Arrow   | T head  | pairs  | 4.000 | 5.50 | 1:1.37 |
| Pierce-Arrow   | T head  | pairs  | 4.500 | 5.50 | 1:1.22 |
| Pierce-Arrow   | T head  | pairs  | 5.000 | 7.00 | 1:1.40 |
| Premier        | T head  | threes | 4.000 | 5.50 | 1:1.37 |
| Premier        | in head | block  | 3.625 | 5.50 | 1:1.52 |
| Speedwell      | Mead    | threes | 4.125 | 5.25 | 1:1.27 |
| Speedwell      | L head  | threes | 4.125 | 5.25 | 1:1.27 |
| Stearns-Knight | Knight  | pairs  | 4.250 | 5.75 | 1:1.35 |
| Stevens-Duryea | L head  | pairs  | 4.312 | 5.50 | 1:1.28 |
| Studebaker     | L head  | block  | 3.500 | 5.00 | 1:1.43 |
| Stutz          | T head  | threes | 4.000 | 5.00 | 1:1.25 |
| Velle          | L head  | threes | 3.750 | 5.25 | 1:1.40 |
| White          | L head  | block  | 4.250 | 5.75 | 1:1.35 |
| Winton         | L head  | pairs  | 4.500 | 5.50 | 1:1.22 |



## INNOVATIONS AT IMPORTERS' SALON.

**T**WO important innovations marked the holding of the annual Importers' Automobile Salon in the Hotel Astor, New York City, this year. One of these was the appearance of two American makes of cars, and the other was the special section devoted to an exhibition of accessories, largely composed of tires, and American manufacturers also were well represented there. The attention directed to light cars—virtually cyclecars—was another feature of the display.

Twelve makes of cars were shown, as follows: Simplex and S. G. V. from America; De Dion-Bouton, Delaunay-Belleville and Peugeot from France; Benz, Mercedes and Bugatti from Germany; Fiat, Isotta-Fraschini and Lancia from Italy; Minerva from Belgium and Marshall Arter from England. With the exception of the Bugatti and Marshall Arter, the foreign machines have all been seen at previous exhibitions in this building. However, the De Dion-Bouton line was new in the sense that only the eight-cylinder model was displayed, and the Peugeot line was augmented by the presentation of the Lion Peugeot and the Baby Peugeot.

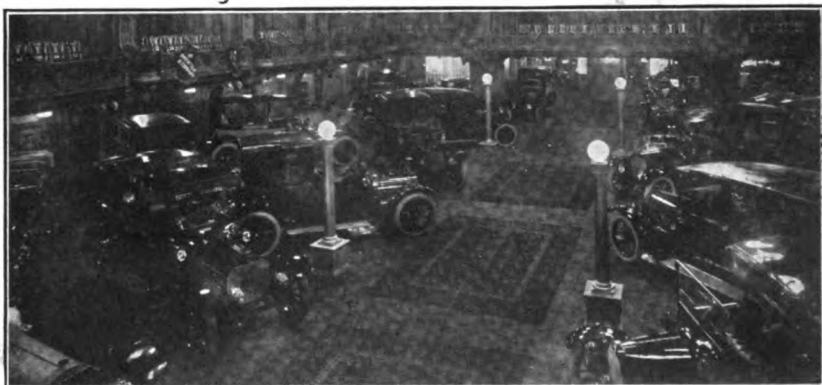
The eight-cylinder De Dion motor is in no sense an experiment. It was exhibited at the European shows a year ago, and is said to have demonstrated its practicability to the satisfaction of the maker in road service extending over a much longer period. The Lion Peugeot does not differ from the regular Peugeot except in the fact that the models are equipped with bodies built by the chassis maker.

Light cars, or cyclecars, were represented by the Baby Peugeot, Bugatti and Marshall Arter. It may be said that these attracted quite as much interest on the part of the visitors at the salon as did the American cyclecars at the Grand Central Palace display. The first named has been seen on New York streets for some months, and to some extent in other sections of the country. For this reason it did not occasion quite the same amount of interest as the other two.

The Bugatti was shown in three models, each seating three persons, two side by side in front and a third at the rear between them. The wheelbase is 94.5 inches and the tread about 36, and,

as may readily be appreciated, there is very little waste space after the three persons are seated. The Marshall Arter was presented in the chassis only, although it was explained that in Great Britain this is fitted with a body seating two persons side by side. The wheelbase is 105 inches and the tread 43.

Cars were displayed in the grand ball room and in the retiring rooms at either end, as well as in the hotel corridors. The accessories were arranged in the retiring rooms at the side of the ball room, and the exhibitors included: Gaulois Tire Corporation, Gaulois tires; Englebert Tyre Company, Englebert tires; Otto Braunwarth, Inc., Dunlop detachable wire wheels and Dunlop tires; Columb Tyres Import Company, Prowodnik tires; A. Faure, Faure tires, and A. J. Picard



Interior of the Hotel Astor Grand Ball Room, During the Importers' Salon—  
Photo by J. F. Lloyd.

& Co., A. V. shock absorbers, motometers, Vacuum Mabiloils, Edison Mazda lamps, Warner speedometers, Knight tires, Gray & Davis lamps, Klaxon horns, Waltham watches, Allen tire cases, Ajax trunks, etc.

At the Gaulois tire booth, attention was directed to the Crown Prince pressed steel demountable wheels, made by Max Bachem, 845 Jefferson avenue, Detroit. These are held to be lighter and cheaper than either wood or wire wheels, and to be 200 per cent. stronger than wood.

It was rumored during the New York show that Henry Ford and Thomas A. Edison had formed a combination for the manufacture of a light electric pleasure vehicle to be known as the Edison-Ford. It was stated that complete details concerning the new car would be announced in the near future.



## MANUFACTURERS PERFECTING DETAILS.

**General Effort Toward More Silent and Flexible Motors, Greater Efficiency and Lower Cost of Maintenance---Equipment Provides Comfort and Convenience.**

**T**HE general impression created by the New York show was that the manufacturer was seeking to relieve the operator of all manual labor except that of driving.

The observing visitor noted that while the tendency was to provide every comfort and convenience, the designer also has been perfecting minor mechanical details in construction which involve economy in the upkeep of the vehicle.

This is particularly true of the power plant, in which, if the few non-

poppet valve motors be excepted, practically no radical changes have been made—nor were they anticipated. The object sought by the designer has been to produce a silent motor, and one obtaining the greatest efficiency with the least possible consumption of fuel and lubricant. With many makers the fuel question has been given serious consideration and in several instances it has resulted in the redesigning of intake manifolds and utilizing means

for raising the temperature of the gasoline.

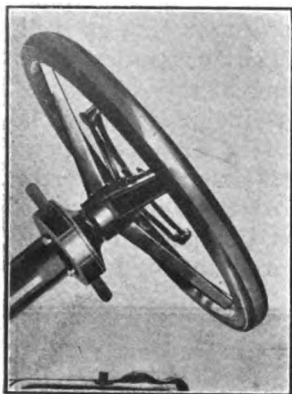
One striking feature of the show was the number of manufacturers who have departed from the custom of building several chassis, or making a number of models

Statistics show that approximately 45 per cent. of the makers are concentrating their efforts upon one chassis to which a number of body styles are fitted. This standardization means a lower cost of production, better workmanship and better results as a whole.

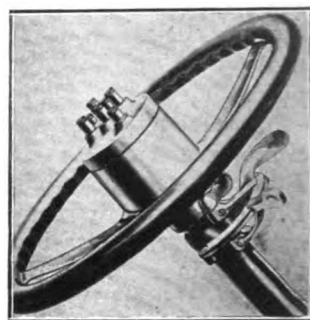
Those who predicted that the 1914 machine would be cheaper may be pleased to learn that the average cost is about \$150 less than last year, but on the other hand the statements made that the present year would see a flood of low priced machines are not borne out by statistics. According to figures the \$2500 car is the popular class, 59 makes being thus listed, while 47 are catalogued in the \$1500 division. Thirty-three makes of what is termed the \$1000 class are noted, while a large number of machines sell in the neighborhood of \$4000. The statistics for 1913 show that there were 79 makes of \$2500

cars and a like number in the \$1500 division.

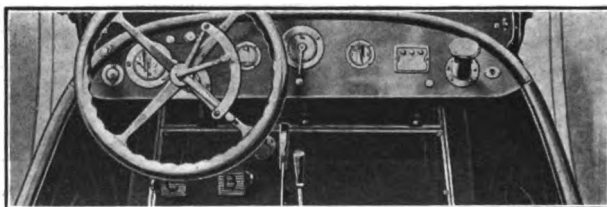
This increase in the number of \$2500 cars is largely due to the new sixes added. Some manufacturers have discarded the four and taken up the six, while others have augmented their line with a new model. That the advocates of the six-cylinder



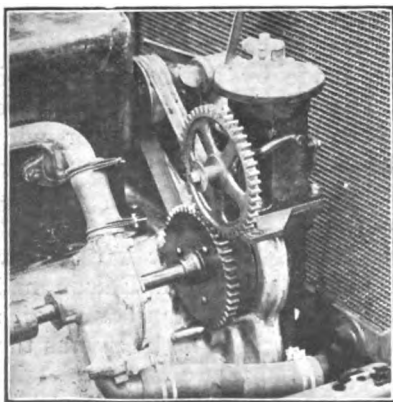
Centralized Control of Stearns-Knight.



Haynes Control of Electric Gearshift.



Flush Mounting of Control Units, a Method Favored by Many Makers—The Fuel Filler Cap Is Shown at the Extreme Right.



Power Tire Pump on Cole Car.



Driveshaft Speedometer Connection.

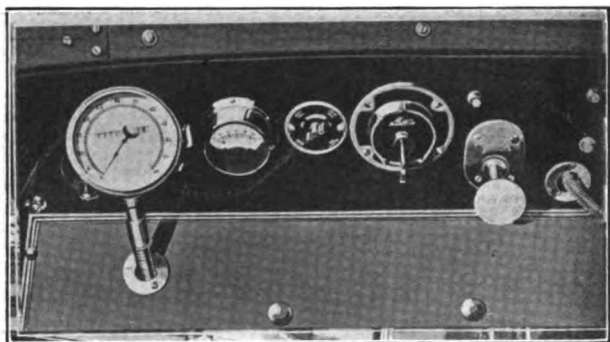


power plant have gained in numbers during the past year is demonstrated by the fact that 34 makers are building sixes, while 55 continue fours exclusively. About 20 manufacturers continue their line with practically no changes.

The demand of the buying public for economy in upkeep has had its influence to a certain extent in the horsepower rating and the high powered motor appeals only to a very few. While there are instances of ratings of 50 horsepower and more, the general average of the six-cylinder motors is three less than in 1913.

As was expected and emphasized by the early announcements of new models, the casting en bloc has grown in favor, particularly among the makers of four-cylinder cars. About 50 per cent. follow this method, while about 44 retain the pairs and only six per cent. the casting of separate cylinders.

While a large number of manufacturers have adopted the en bloc method of casting sixes, the majority favor the triplet construction, about 34



**Compact Grouping of Instruments on Control Board Makes for Convenience in Operation.**

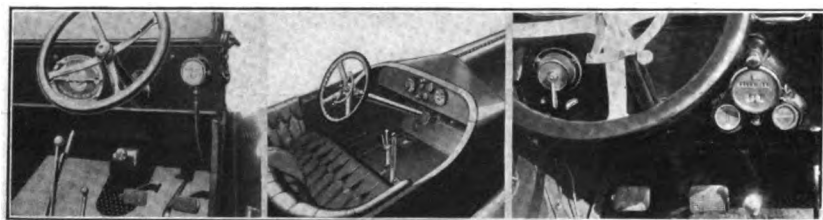
slide valve motor, and the Great Western Automobile Company offers the Carter piston valve engine as an option. This represents a substantial gain over last season.

The valve-in-the-head design appears to have lost adherents, there being about four per cent. less makers utilizing it. A new construction is the Premier Weidely motor, which is described and illustrated elsewhere in this issue, as are the various types of non-poppet valve engines.

In their effort to obtain increased efficiency from the motor the use of larger valves is noticeable, and in the majority of instances a two-inch valve is utilized. In keeping with the policy of economy many makers

have adopted tungsten steel for valve material, a metal requiring less grinding and productive of better wearing qualities.

Enclosed valves are generally employed, at least 75 per cent. of the cars being fitted with some form of cover. As a rule two plates are utilized to cover the valve mechanism, and with all, means are provided for removing and replacing these parts with a minimum of effort.

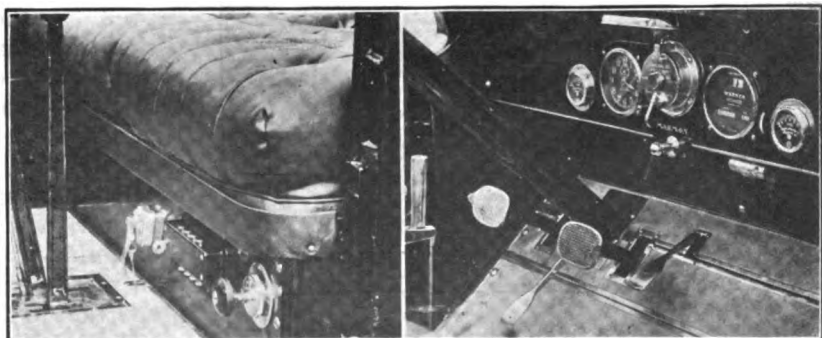


**Instances of Compact and Convenient Grouping of Control Instruments: At Left, Hupmobile; Centre, National; Right, Studebaker.**

per cent. of the sixes listed using this form. Pairs are used by 32 per cent., the makers pointing out that they are more easily handled by the repairman than the en bloc casting. Only two per cent. employ cylinders cast separately.

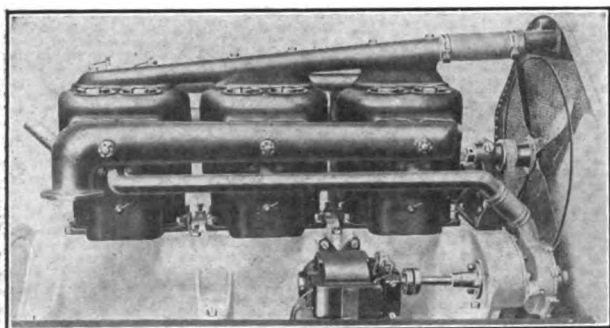
With the en bloc casting the L head type of motor is generally favored and the number of makers placing all of the valves on one side has increased considerably since last season. That the T head design is considered good practise is evidenced by the fact that fully as many makers are utilizing this construction as formerly.

The non-poppet type motor shows a gain over the past year, the Knight motor having been adopted by the Moline Automobile Company, the Willys-Overland Company and the Lyons-Atlas Company. The Palmer & Singer Manufacturing Company has taken up the Fischer-Magic



**The Location of Controls of Marmon Differs from General Practise, and the Dash Equipment Is Neatly Grouped.**





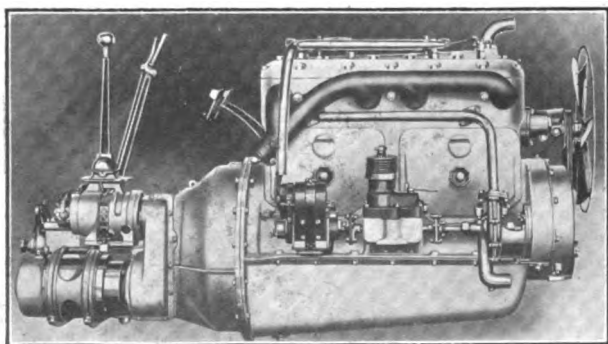
**Casting the Cylinders in Pairs Is Favored by Some Makers of Six-Cylinder Cars.**

One of the noticeable features of the new motors is the placing of the valves with the L head type of motor at the right. This is due to the fact that left hand drive is practically universal. With the steering column located at the left, and with the addition of motor starters, generators, power tire pumps, etc., the right hand location makes for convenience.

It may truthfully be said that the new types of motors are not only more silent than formerly, but they are better balanced. Vibration has been practically eliminated by balancing the relation of the reciprocating parts. Lighter pistons are the rule rather than the exception, but the reciprocating parts are heavier.

Fewer piston rings appear to be used and there is a tendency to place these nearer the top of the piston. The use of four rings, three above the wristpin and one below it, is an exception. Improved machinery and better material and workmanship have enabled the motor manufacturer to obtain efficiency with a smaller number of rings. That friction is reduced is obvious.

Crankshafts are made stronger and there is a tendency to utilize larger bearings, especially the rear main bearing. This is explained by the

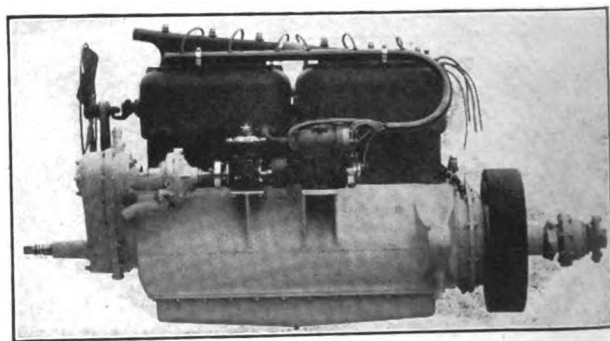


**Unit Power Plants with Cylinders Cast En Bloc and Removable Heads Are Gaining Advocates—The Designer in This Instance Combines the Generator and Motor Starter with the Gearset, Thereby Distributing the Weight.**

maker as being necessary with the motor starter. Plain bearings are the rule and the advocates of the ball bearings are holding their own.

Cooling by water is favored by all but 2.5 per cent. of the makers, the air-cooled advocates having lost one in the Cameron car, which was air-cooled last season. The pump is the most popular method of circulating the cooling fluid, 72 per cent. of the makers utilizing it, while 24 favor the thermo-syphon. The latter method is more noticeable in the new four-cylinder cars and in the majority of instances the machines are classified as of the popular price type. Cellular type radiators are practically universal, but some makers continue the honeycomb design.

In the matter of lubrication it is estimated that fully 90 per cent. of the 1914 cars are equipped with a combined pressure and splash method of lubrication. In the majority of systems the lubricant is forced by some form of pump to the main bearings, whence the oil over-



**Illustrating Casting of Cylinders in Triplets and Method of Driving Water Pump, Tire Pump and Magneto.**

flows into troughs into which the connecting rods dip, splashing lubricant to the cylinder walls, pistons, gears, etc. The constant level form of splash is included, the oil being maintained at a predetermined level.

A feature of the lubrication systems is the use of accessible oil gauges or indicators, improved breathers and more convenient drain cocks. The manufacturer has at last appreciated the difficulty experienced in draining a crankcase of oil through small petcocks.

Pressure feed is still employed and is likely to be for some time to come. There are several excellent examples of this form of lubrication, among which may be named that employed on the Moline-Knight. This is an all-pressure system, there being no splash and the oil is fed in proportion to the motor speeds.

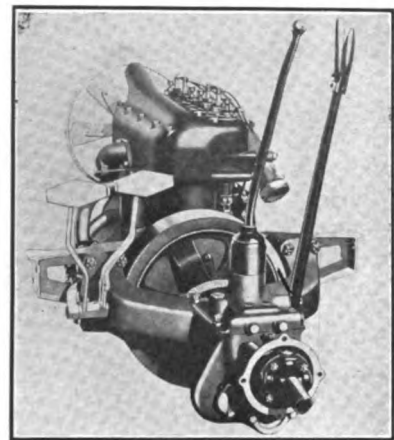
The large and unsightly dash sight oil feed has been eliminated and when an indicator is located on the instrument board it is neat and com-



pact, although the general practise is to do away with it entirely. With the improved lubricating methods and with the oil reservoirs entirely contained within the crankcase, there appears to be no reason for the use of indicators.

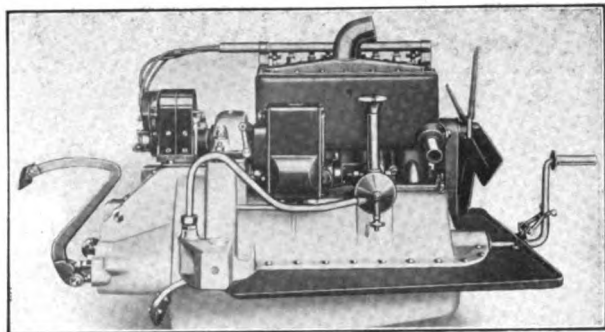
The use of single ignition is gaining many adherents, and this is especially noticeable of cars selling in the neighborhood of \$2500. Last year 10 per cent. of the makers in this division favored the single ignition. This year about 33 per cent. have adopted it. The dual system of ignition predominates, over 59 per cent. of the makers continuing its use, but it is very evident from the above figures that the single method will be more favored in 1915 than it was this season.

This is explained by the use of the motor starter, which rotates the flywheel at a speed to permit of the production of sufficient electrical energy from the magneto to start, or, in other words, it is possible to spin the motor and armature shaft of the magneto fast enough to obtain a hot spark. The use of single ignition also eliminates, according to some makers, a complication of wires.



That Compactness Is Sought by the Designer Is Noticeable in the Max-well Power Plant.

popular several years ago, and before the magneto was generally adopted, has made its reappearance, due to the use of electric lighting systems. Several makers have adopted a generator with the distributor as a unit, taking current from the battery or from the dynamo itself. The Delco is an exemplification of the use of the dynamo current, and the practicability of this system has been proven by its adoption by several prominent car makers. Several concerns manufacturing electric lighting dynamos produce units with distributors and it would appear that the advocates of this form of ignition are gaining in numbers. Synchronization of the spark is obtained by improved distributing methods, as well as compactness in design. On the other hand, the advocates of the magneto state that the high-ten-



Several Makers Are Eliminating the Conventional Under Pan or Shield, a Construction Made Possible by the Unit Power Plant with Enclosed Flywheel.

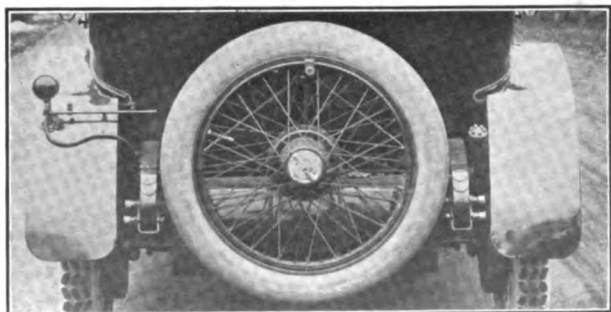
sion instrument is too firmly intrenched; that its durability and efficiency have been demonstrated by years of service.

The multiple disc type of clutch, including the lubricated and dry forms, continues to predominate in number, nearly 52 per cent. of the 1914 cars being equipped with it. The cone clutch is favored by 42 per cent. of the makers, but the band, both contracting and expanding forms, has gained two per cent. since 1913.

As was expected the adoption of the unit power plant has resulted in a decrease in the number of makers placing the gearset amidships. This has lost over 13 per cent., while only 16 per cent. locate the gearbox on the rear axle.

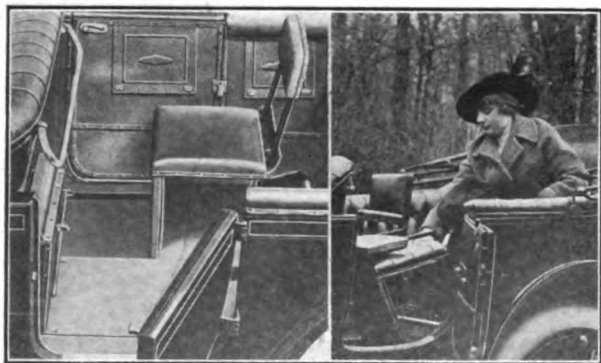
The unit power plant with the flywheel enclosed has found many advocates during the past year and in some instances the under pan or shield has been eliminated. This method has its advantages in that the draughts of air passing under the lower crankcase assist in lowering the temperature of the lubricant. The upper half of the crankcase, cylinders, magneto, carburetor, etc., are protected from mud and water by the use of pans or covers extending from the crankcase to the frame.

Despite the arguments brought to bear against the adoption of the four-speed gearset, it is noticeable that its advocates have gained over



Keeton Method of Carrying Spare Wheel and Suspension of Fuel Tank.





**Auxiliary Seats Are Now of the Disappearing Type, Folding into Recesses in Back of the Front Seats.**

seven per cent., nearly 30 per cent. of the makers having adopted it. The three-speed predominates, 67 per cent. of the cars being fitted with the conventional form, while two utilize the two-speed.

With the four-speed gearset the general practice is to employ a direct drive on the third and utilize a step-up for the fourth. With the lighter motor the advocates of the four-speed gearset emphasize flexibility and economy. The selective type of gearset may be said to be universal. Referring once more to the use of the unit power plant and the general adoption of left hand location for the driver, it has eliminated the unsightly quadrant and linkage and enabled the placing of the levers on the transmission housing.

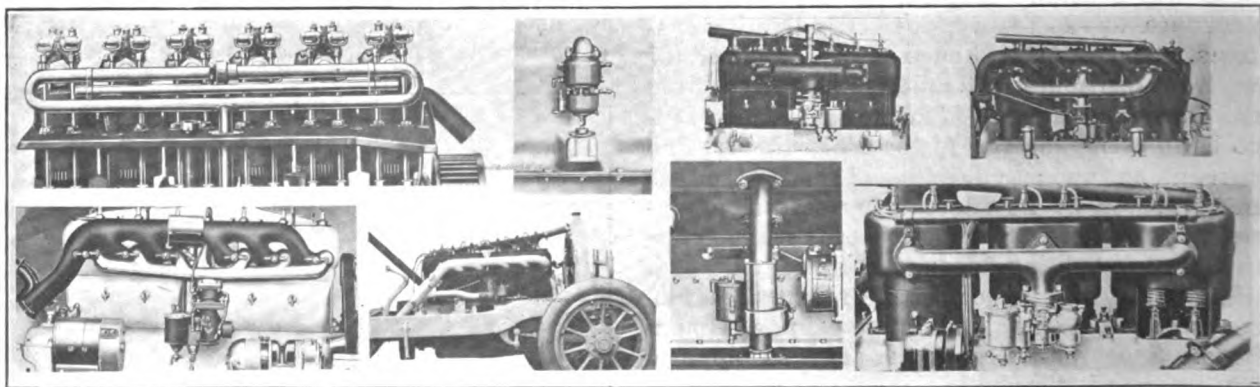
While statistics show that the pressure feed is favored by four per cent. less makers than in 1913, the decrease is due to the use of the cowl dash and gravity feed. The last named system permits of mounting the carburetor higher, but deducting the number of makers employing this system, the pressure feed has really gained. In some instances the fuel is forced by pressure to an auxiliary tank and the gasoline is supplied to the carburetor by gravity.

The use of a low grade gasoline and the motor starter has resulted in an improvement of carbureting methods. The carburetor is now carried higher than formerly and in proximity to the water jackets of the cylinders, where the heat aids in raising the temperature of the fuel. Several makers have adopted water jacketing the intake manifold, and when this method is not utilized the heat of the exhaust is employed. As a result the intake manifolds have been redesigned, being shorter and freer from bends, a construction reducing opportunity for the condensation of the mixture and making starting easier in low temperatures.

Water jacketing both the intake and exhaust manifolds is becoming more popular and with the thermo-syphon system of cooling the manifold and water head are cast in one piece. Detachable cylinder heads have appeared on several motors, being particularly noticeable on new cars.

Electric lighting systems including a generator are now favored by nearly 90 per cent. of the makers and the equipment is found on cars selling as low as \$900. While minor improvements are noted in the dynamos, the most striking feature is that the manufacturer has provided for a greater output at low motor speeds to take care of operating conditions in traffic. The output at higher ratios is cared for by the usual regulation and in some instances the maximum output of the generator is about 15 miles an hour car speed.

Transmitting the energy of the electric motor starter to the flywheel by gearing is favored by 62 per cent. of the makers, while about 15 per cent. utilize a gear and silent chain. The balance employ a silent chain to the crankshaft or drive through the timing gears. A few have installed the motor starter in proximity to or with the



**Carburetors Are Being Located Near the Water Jackets, and the Intake Manifolds in Several Instances Are Water Jacketed—The Heat of the Exhaust Is Utilized by a Large Number of Makers to Raise Temperature of Fuel.**



transmission. The control of the motor starter is varied, including a lever, pedal or push switch on the floorboard or instrument board, or having the control member conveniently placed on the steering column.

The use of heavier frames is noticeable, the channel sections being made deeper, heavier and more liberal gusset plates being fitted and more attention paid to the work of riveting. Brakes are now fitted to the rear wheels and with a very few exceptions the transmission type has been abandoned. Tire sizes are practically the same, but when it is considered that the motors are lighter, and that improved manufacturing methods have made possible the lightening of motor equipment, the average car may be said to be properly tired and in some instances over tired.

The adoption of the left hand control has made necessary the grouping of the control and indicating instruments at the left, and in many instances this has been accomplished in a very neat and compact manner. Flush mounting predominates. In the matter of control, it is noticeable that the gearshift and emergency brake levers have been shortened and their movement more restricted than formerly. This permits of easy operation, especially when a robe is utilized.

One of the features of the 1914 equipment is the adoption of a power tire pump by several manufacturers. While it was conceded that the demountable rim, with extra rims carrying spare tires, was a long step toward solving the tire changing problem, the power pump appeals to the owner as a most necessary convenience and a labor saver. In the majority of installations drive is by gear through a shaft and several makers have placed the pump between the water pump and the magneto. Service of the tire pump is obtained by the movement of a small lever which meshes a driving and driven gear. One or two instances are noted where the drive for the pump is taken from the flywheel.

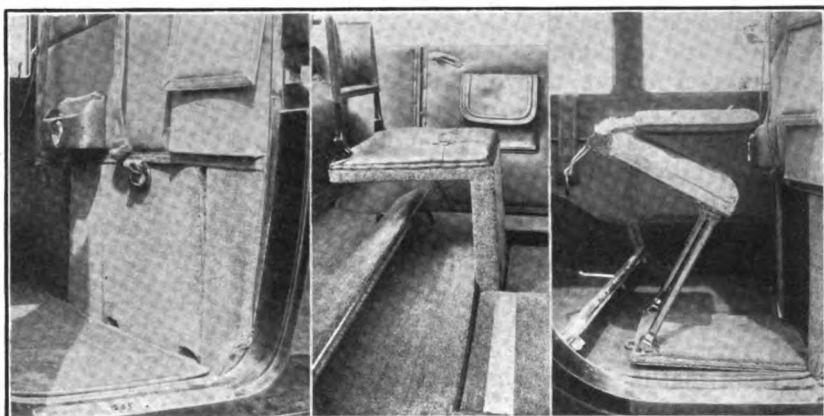
The equipment is more complete than formerly and demountable rims are universal. Wire wheels have not made the gain predicted, but several makers list them as optional. One of the reasons advanced for the small number of wire

wheels employed is that the car makers have been unable to obtain them in quantities.

One-man tops, so called because they may be raised and lowered by one person, are now standard equipment with a number of makers. Inside curtains and those which roll up with the top are now fitted to the popular priced machine.

A departure from conventional practise in auxiliary seats is the use of the disappearing type, which folds into a recess in the back of the front seats or into the floor. Several constructions are shown in accompanying illustrations, and it will be noted that when closed the seats are practically unnoticeable. The design also provides additional room in the tonneau when not in service.

Crowned fenders, that is, slightly so, are meeting with favor, the effect being to give a more solid structure and at the same time to add to the attractiveness of the car. The body work of the



Illustrating the Progressive Steps in Utilising Auxiliary Seats, the View at the Left Showing the Advantage of Design When Not in Service.

1914 American car is decidedly better than with previous designs. The streamline form has been highly developed, and with this design there is an unbroken line beginning at the top of the radiator and continuing rearward to the end of the cowl. The line of the latter blends gradually into the line running along the side of the body, and the absence of abrupt lines is noticeable.

The upholstery of the new machines leaves very little to be desired in the way of comfort, and it is possible to accomplish long tours without fatigue. The divided seat, which has long been discarded, appears to be making a bid for popularity in at least one model, the maker of which utilizes a form of roll which is very attractive. The enclosed types of bodies are equally distinctive in appearance and many makers offer a variety to meet individual requirements.



## RESULT OF MOLINE-KNIGHT MOTOR TEST.

THE official report of Herbert Chase, laboratory engineer for the Automobile Club of America, at the conclusion of the 336-hour test of the Moline-Knight engine, which came to an end in the club's laboratory at 7 the evening of Jan. 2, shows this to have been a most remarkable test of a remarkable motor. The results are set forth below, and it is only necessary to add that this was the second motor of this type made by the Moline Automobile Company, East Moline, Ill., and was a standard stock model, as indicated by an affidavit filed with the club by the manufacturer. The test is by far the longest ever given any automobile motor in this country or abroad.

Particular attention is drawn to the fact that, at the completion of the original test, in which the motor showed an average horsepower of 38.3 at a crankshaft speed of 1117 revolutions a minute, it was run for another hour at a speed of 1682 revolutions a minute, at which it developed 53.6 horsepower. The rating of the engine under the S. A. E. formula is 28.16. The motor also was given a five-hour fuel economy test, in which it was run at an average speed of 1114 revolutions a minute, developing an average of 39.8 horsepower and consuming .63 pound of gasoline a brake horsepower-hour.

Some idea of the work accomplished by this motor during this test may be gained from the statement that it was equivalent to driving a Mo-

line-Knight car at a rate of 45 miles an hour, continuously for 14,700 miles, or about 41 miles a day for every day in the year.

Otherwise the story is told in the following extracts from the official report and the accompanying charts and table:

### Endurance Run.

**Power**—The motor ran without any stop whatever for 336 hours with wide open throttle and set spark at an average speed of 1117 revolutions a minute. During this period the average brake load at one foot radius was 180 pounds, giving a resultant average brake horsepower of 38.3. The lowest horsepower reading for any 15-minute interval during the entire 336 hours was 36.4. At the end of this period, without stopping the motor, the speed was increased, and the motor developed an average of 53 brake horsepower for a period of one hour, while averaging 1678 revolutions a minute.

**Fuel**—The total fuel supplied during the run of 336 hours was 10,645 pounds, or 1744 gallons. It was found at the end of the endurance test, however, that a small hole had been worn through the fuel supply pipe at a point where the latter chafed, due to vibration, against a joint on the crankcase. The leakage of fuel from this hole was not discovered because of the rapid vaporization brought about by the blast of air used to cool the crankcase. By observation of the fuel curve as given in its chart, it is evident that the rate of fuel consumption gradually decreased for the first 160 hours, and thereafter increased to the end of the test, indicating that the leakage started at or about the 160th hour, and gradually became greater thereafter. The average consumption an hour for the first 160 hours was 31.5 pounds. For the last 10 hours of this 160-hour interval it was 30.8 pounds an hour. The actual consumption for the remaining 177 hours of the test is questionable because of fuel leakage. The gasoline used was taken from the same supply regularly delivered for use in the club's garage, and gave an average Baume reading of 61.6 degrees at 60 degrees Fahrenheit, equivalent to 0.733 specific gravity.

**Oil**—The total quantity of oil put into the motor during 337 hours running in the endurance test was taken from 34 sealed five-gallon cans, giving a total supply of 170 gallons. A total of seven quarts was taken from

### AVERAGE RESULTS FOR EACH FIVE-HOUR PERIOD.

| HOUR                              |     | GASOLINE PER   |        |      |       | HOUR |     | GASOLINE PER   |        |      |       | HOUR |     | GASOLINE PER   |        |      |       |
|-----------------------------------|-----|----------------|--------|------|-------|------|-----|----------------|--------|------|-------|------|-----|----------------|--------|------|-------|
| From                              | To  | AVERAGE R.P.M. | B.H.P. | Lbs. | Gals. | From | To  | AVERAGE R.P.M. | B.H.P. | Lbs. | Gals. | From | To  | AVERAGE R.P.M. | B.H.P. | Lbs. | Gals. |
| 0                                 | 5   | 1127           | 38.5   | .83  | .136  | 111  | 115 | 1113           | 38.4   | .82  | .134  | 221  | 225 | 1114           | 38.9   | .81  | .133  |
| 5                                 | 10  | 1119           | 38.5   | .83  | .136  | 116  | 120 | 1116           | 38.4   | .82  | .134  | 226  | 230 | 1109           | 38.5   | .82  | .134  |
| 10                                | 15  | 1114           | 38.3   | .83  | .136  | 121  | 125 | 1115           | 38.4   | .82  | .134  | 231  | 235 | 1114           | 38.5   | .82  | .136  |
| 15                                | 20  | 1116           | 38.2   | .83  | .136  | 126  | 130 | 1121           | 38.7   | .81  | .133  | 236  | 240 | 1108           | 37.9   | .83  | .136  |
| 20                                | 25  | 1117           | 38.1   | .83  | .136  | 131  | 135 | 1122           | 38.7   | .81  | .133  | 241  | 245 | 1112           | 37.8   | .84  | .137  |
| 25                                | 30  | 1114           | 38.2   | .83  | .136  | 136  | 140 | 1118           | 38.4   | .82  | .134  | 246  | 250 | 1114           | 37.9   | .84  | .137  |
| 30                                | 35  | 1124           | 38.4   | .83  | .136  | 141  | 145 | 1116           | 38.6   | .82  | .134  | 251  | 255 | 1111           | 37.7   | .83  | .136  |
| 35                                | 40  | 1117           | 38.0   | .83  | .136  | 146  | 150 | 1120           | 37.8   | .82  | .134  | 256  | 260 | 1115           | 38.0   | .84  | .137  |
| 40                                | 45  | 1122           | 38.2   | .83  | .136  | 151  | 155 | 1122           | 37.4   | .82  | .134  | 261  | 265 | 1114           | 38.1   | .83  | .136  |
| 45                                | 50  | 1122           | 38.4   | .83  | .136  | 156  | 160 | 1123           | 37.5   | .82  | .134  | 266  | 270 | 1116           | 38.1   | .84  | .137  |
| 50                                | 55  | 1113           | 38.0   | .82  | .134  | 161  | 165 | 1116           | 37.4   | .83* | .136* | 271  | 275 | 1123           | 38.2   | .84  | .137  |
| 55                                | 60  | 1117           | 38.1   | .83  | .136  | 166  | 170 | 1112           | 37.6   | .82  | .134  | 276  | 280 | 1121           | 38.2   | .84  | .137  |
| 60                                | 65  | 1118           | 38.1   | .83  | .136  | 171  | 175 | 1115           | 38.1   | .83  | .136  | 281  | 285 | 1122           | 37.9   | .85  | .139  |
| 65                                | 70  | 1114           | 38.5   | .82  | .134  | 176  | 180 | 1116           | 38.5   | .82  | .134  | 286  | 290 | 1122           | 37.7   | .86  | .141  |
| 70                                | 75  | 1119           | 39.0   | .82  | .134  | 181  | 185 | 1112           | 38.6   | .82  | .134  | 291  | 295 | 1121           | 38.2   | .85  | .139  |
| 75                                | 80  | 1112           | 39.0   | .81  | .133  | 186  | 190 | 1114           | 39.1   | .81  | .133  | 296  | 300 | 1118           | 37.9   | .84  | .137  |
| 80                                | 85  | 1110           | 38.6   | .82  | .134  | 191  | 195 | 1114           | 39.6   | .80  | .131  | 301  | 305 | 1115           | 37.6   | .85  | .139  |
| 85                                | 90  | 1110           | 38.5   | .82  | .134  | 196  | 200 | 1114           | 39.8   | .80  | .131  | 306  | 310 | 1120           | 37.7   | .85  | .139  |
| 90                                | 95  | 1113           | 38.1   | .83  | .136  | 201  | 205 | 1120           | 40.1   | .80  | .131  | 311  | 315 | 1116           | 37.8   | .86  | .141  |
| 95                                | 100 | 1113           | 37.8   | .83  | .136  | 206  | 210 | 1118           | 39.6   | .81  | .133  | 316  | 320 | 1118           | 38.0   | .85  | .139  |
| 100                               | 105 | 1108           | 38.0   | .82  | .134  | 211  | 215 | 1124           | 39.6   | .81  | .132  | 321  | 325 | 1116           | 38.0   | .85  | .139  |
| 105                               | 110 | 1109           | 38.3   | .82  | .134  | 216  | 220 | 1107           | 38.6   | .82  | .134  | 326  | 330 | 1120           | 37.8   | .86  | .141  |
|                                   |     |                |        |      |       |      |     |                |        |      |       | 331  | 335 | 1120           | 37.6   | .86  | .141  |
| Power and Fuel During 337th Hour. |     |                |        |      |       |      |     |                |        |      |       |      |     |                |        |      |       |
|                                   |     | 336            | 337    | 1678 | 53.0  | .80  |     |                |        |      |       |      |     |                |        |      | .131  |

\*Leak in gasoline pipe probably started at this point. Fuel readings thereafter probably in error, i. e., too high.



the motor during and following the test, leaving a net supply of 168.23 gallons. Throughout the test oil was overflowing from the flywheel bearing. In 15-minute runs prior to and following the endurance test, the average overflow was found to be about .87 pint an hour. Assuming that the average rate of loss throughout the endurance test was the same as the average loss in the short runs before and after, the total loss in 337 hours would be 36.6 gallons, leaving a net total consumption of 131.6 gallons (967 pounds), or .39 gallon an hour. The oil used was supplied by F. H. Floyd of Detroit, who states that it was compounded from Russian and domestic stock.

#### Short Runs.

Prior to and following the endurance run, a series of short runs was made—with wide open throttle and spark set for maximum power—to determine the power, friction and fuel consumption of the motor at various speeds. The same carburetor setting employed during the endurance run was used in these runs. The maximum brake horsepower shown in these tests was 53.6 at 1682 revolutions a minute.

**Special Fuel Efficiency Test**—In order to demonstrate the ability of the motor to run with a lower fuel consumption than that shown in the endurance run, and other runs mentioned above, the carburetor was readjusted, and the motor thereafter subjected to a five-hour run at an average speed of 1114 revolutions a minute, and a series of short runs at different speeds. The aver-

#### Cooling and Exhaust.

During the test thermo-syphon cooling was obtained by connecting the motor to a tank of water placed in approximately the same relative position to the motor as the radiator on the Moline car. Sufficient cold water was added to the warm water in the tank to maintain an average temperature of 85 degrees F., of water entering the motor. The average temperature of water leaving the motor was 166 degrees F.

The exhaust from the motor was discharged into a short length of 2.5-inch standard pipe, and thence into an expansion chamber, from which it escaped to atmosphere through a long three-inch vent pipe. The exhaust was slightly smoky during a portion of the test.

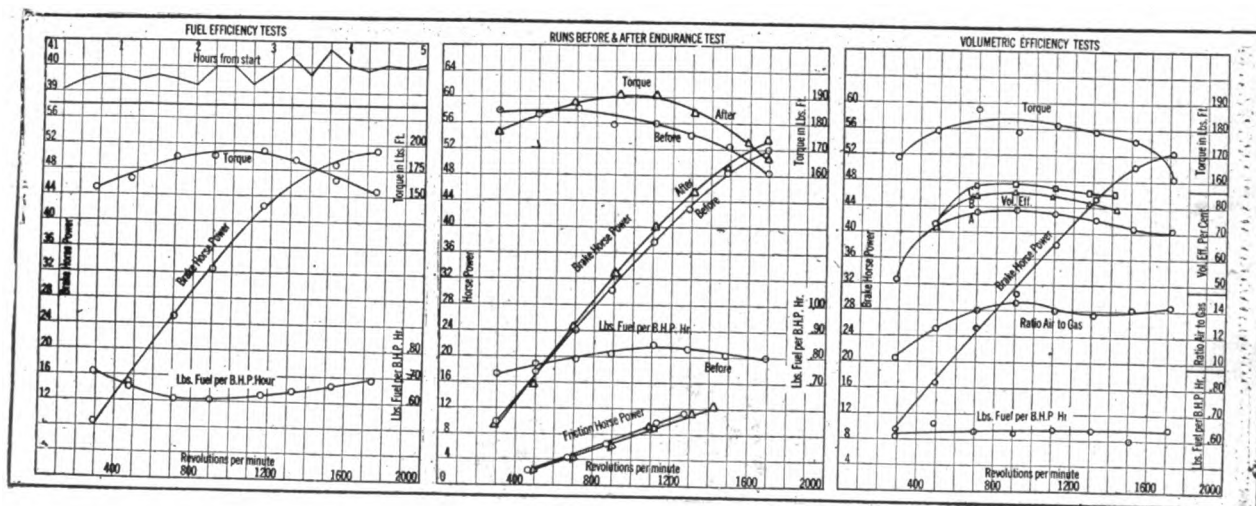
A blast of air, having a velocity of about 34 miles an hour, was directed against the crankcase of the motor during the endurance and other runs in which the motor was developing power.

#### Atmospheric Conditions.

There was a wide variation in atmospheric conditions during the test, the temperature of the air blowing on the motor varying from 37 to 71 degrees F., with an average of 57 degrees, while the barometer varied from 28.95 inches to 30.19 inches of mercury, with an average of 29.83 inches. It was noted that the power of the motor increased and decreased as the barometer rose and fell.

#### Condition of Motor.

The motor was dismantled before and after the tests here reported to permit careful inspection. At the end



age brake horsepower for the five-hour run was 39.8, and the average fuel consumption .63 pound (equivalent to .103 gallon) a brake horsepower-hour.

**Volumetric Efficiency Test**—Following the fuel efficiency test the carburetor, with no change in adjustment, was enclosed in an air box, which was clamped between the carburetor flange and the inlet manifold. The sole air inlet to this box was piped to a Venturi meter, and the air consumption of the motor measured under the following conditions:

- Carburetor in place, motor running under own power.
- Carburetor in place, motor driven by dynamometer.
- Carburetor removed, motor driven by dynamometer.

#### Adjustments.

The only adjustments made on the motor during the endurance run had to do with the fan and its driving belt. At the 131st hour the fan stopped, due to heating from slipping and gummy oil. The fan was removed, bearing cleaned and fan and belt replaced. At the 179th hour the belt was so loose that it hit the fan blades and jumped off. In applying a new belt the thin outer rim of the V pulley was broken and the belt removed. The fan (which is one piece with pulley) was removed at the 182nd hour. During the 326th hour a new fan and belt was put on, but the belt jumped off after about 10 minutes running, and was not replaced until after the endurance run.

of the test the parts of the motor were, without exception, in excellent condition. There was no perceptible wear on the bearings, sleeves or other parts. The slight irregularities in the sleeves were built up with carbon to form close fitting, glossy surfaces. The ports in the sleeves were not burnt, and there was only a very slight deposit of carbon on the port edges. The cylinder heads and the tops of the pistons showed only a very thin coating of carbon, and only small quantities of carbon were found elsewhere. No shake could be felt in any bearing, and there was every indication of perfect lubrication. There was not a single ring in either piston or cylinder head which was not perfectly free at the end of the test. The running of the motor as regards noise and vibration was not appreciably different at the end of the test from that at the start and early hours.

#### Ignition and Carburetion.

The carburetor employed was a 1.5-inch nominal size, model R Schebler, which has a tapered needle whose position in the nozzle is controlled, through a lever connection, by the position of the air valve. No changes in the carburetor setting were made during the endurance test.

Ignition was furnished by a Bosch DU model 4A Duplex magneto. Four Bosch plugs with heavy three point electrodes were put in at the start of the test, and none of these was taken out of the cylinder or otherwise disturbed until after the endurance test was completed. The electrodes were partly burned away, so that the gap was increased, but the regularity of firing was noticeable throughout.

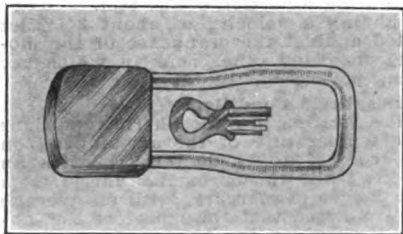


## NEW ACCESSORIES FOR THE MOTORIST.

### BRIDGES FORD LOCK.

**Secures Starting Crank to Spring by a Shackle.**

The Bridges Ford lock is manufactured by the Cochran Pipe Wrench Company, 7800 Woodlawn avenue,



Chicago, and the maker states that it absolutely locks the machine, preventing starting of the motor with the crank, or by use of a jacked up rear wheel.

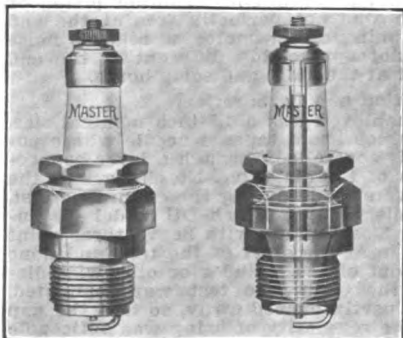
The device comprises a padlock, having a special nicked steel shackle of proper proportions to encircle the car spring and the starting crank when the latter is pushed back into engagement with the crankshaft of the motor. The lock and shackle are combined, and when not in service are removed from the spring, a design requiring no drilling or fitting to utilize. Each lock is equipped with two keys and it is stated that there are no duplicate sets. The Bridges lock is moderately priced.

### MASTER SPARK PLUG.

**Constructed to Meet Demand for a High Grade Plug.**

Believing that there is a demand for a high grade spark plug, the Hartford Machine Screw Company, Hartford, Conn., is manufacturing what is termed the Master plug, which is to be marketed at a moderate price because of a production in quantity. The porcelain is made extra heavy and the company states that the design will withstand strains which break down ordinary insulators.

The seat for the porcelain is very wide and well cushioned, and ample margin is provided for the effects of expansion and contraction. One of the qualities emphasized in



the Master plug is that it may be easily and quickly disassembled and the parts replaced without interfering with their efficiency. Throughout the best of material and workmanship are incorporated.

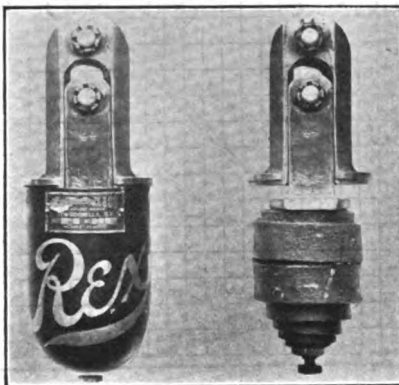
The Master is made in standard threads and with varying lengths of base to meet the requirements of varying motor design. The company is licensed under the Canfield patent, and calls attention to its facilities for manufacturing in large quantities. The plug is moderately priced.

### REX SHOCK ABSORBERS.

**Made in Various Forms for Different Suspensions.**

The Rex shock absorber is manufactured by the Rex Shock Absorber Company, New Rochelle, N. Y., and Stamford, Conn., and is designed for use on front and rear springs and for varying suspensions. A feature emphasized by the maker is the use of a double volute spring in such manner that it absorbs the upward and downward movements, and with the use of but one adjusting nut.

The frame or shackle is made in



one piece, and the inner fork is similarly constructed. The last named has a compact guide inside the outer frame, an arrangement that the maker states makes for great strength as well as eliminates wear of the mechanism. The absorber spring is contained in a grease and oil tight cover.

The Rex shock absorbers are made in different sizes and for all types of cars. The company is manufacturing a new design, similar to the Rex, but utilizing an air cushion.

### ELECTRIC LIGHTING.

That the convenience of electric lighting appeals to the owner of the used car is demonstrated by the increasing number of equipments designed especially for this service. Several makers include brackets for mounting the generator, and generally the equipment is complete. Several concerns are also marketing motor starters for the used vehicle.

### LICENSE NUMBER FRAME.

**An Attractive Holder for Retaining Number Plate.**

License number plates with cracked or broken enamel detract from the appearance of the car and to protect



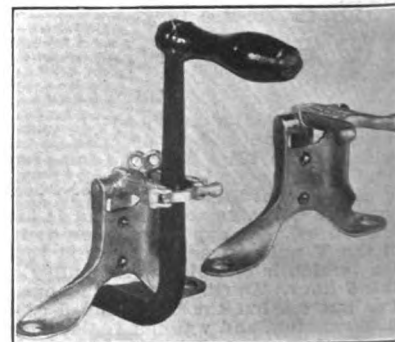
and secure them the Auto License Number Frame & Supply Company, 1409 Turks Head building, Providence, R. I., is manufacturing an attractive frame, which is constructed in a variety of materials and finishes.

The number plate is inserted and held securely by screw bolts, preventing vibration, and the combination attached to the regular holder, provision being made to fit varying designs. The frame is constructed of highly polished aluminum, bronze and yellow brass. The last two named materials are also supplied with a nickel plate finish. One of the qualities of the aluminum frame is that it is very light.

### STARTING CRANK HOLDER.

**Designed for Ford Cars and is Also Made with Lock.**

A practical accessory which will appeal to the owners of model T Ford cars, is the starting crank holder being marketed by the Auto License Number Frame & Supply Company, Providence, R. I. It is made in two styles, one including a revolving lock with a detachable key. Both designs are attached in a few minutes by removing the nuts securing the spring clip bolts, slipping the holder frame over, and replacing the nuts. One of the qualities of the holder is that it can be moved instantly upward and out of the way of the starting crank when the use of the latter is desired. The crank is securely held in an upright position, preventing rattling. The lock proper is well designed.

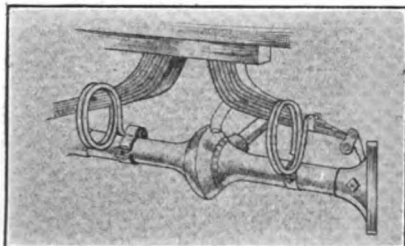




**CUSHIONET SHOCK ABSORBER.**

**Ford Design Clamps to the Axle and the Spring.**

The Walker-Moore Manufacturing Company, Racine, Wis., is marketing the Cushionet shock absorbers, which



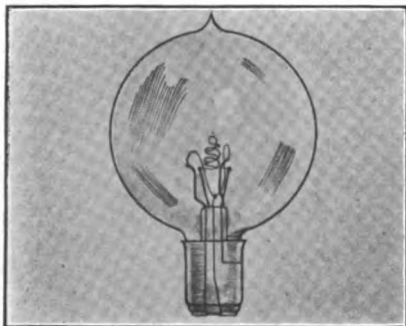
are stated to be a practical solution of the shock absorber problem for the model T Ford automobile. They are made for both the front and rear springs, and no adjustment, fitting or alterations are necessary. They are quickly attached by hooking the top arm over the spring, then forcing the lower arm downward, and bolting a clamp to the axle. This, the maker states, provides the proper tension. It is also claimed that a set of four can be fitted to the car by a novice in less than 30 minutes. The Cushionets are made of crucible steel with drop forged fastenings.

**TULITE AUTO BULB.**

**Employs Two Filaments, One of Which Is for City Driving.**

One of the features of the electric lighting equipment of the 1914 models displayed at the New York show was the dimming attachment, a construction permitting of so reducing the candlepower of the headlight bulbs as to eliminate glaring effects. The Tulite Auto Bulb Company, Detroit, is manufacturing the Tulite bulb, which obtains the dimming effect, and a quality of the design is that but a single bulb is employed in the headlight.

Two filaments are utilized, these being so arranged that the use of the smaller does not impair the efficiency of the other. A standard four candlepower light is provided for city work, and a 20 candlepower member for country driving. The first named provides sufficient illumination for ordinary driving at low speeds in the country, but does not have the undesirable glaring effect noticeable with



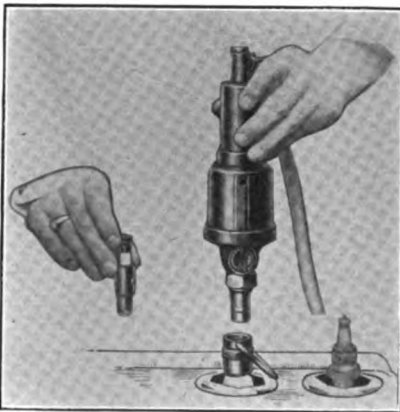
lamps of larger candlepower. One of the qualities of the Tulite bulbs is that they may be utilized on a car equipped with electric lights by connecting the side light circuit to the small Tulite filament.

**MAYO PUMP SPARK PLUG.**

**Quick Detachable Type for Use with Power Pump.**

The Mayo Manufacturing Company, Chicago, maker of the Mayo power tire pump, has brought out the Mayo quick detachable spark plug for service with its product. It comprises an adapter, which is permanently installed in the cylinder, a connection for attachment to the lower end of the pump, and a part which is threaded into the adapter and which acts as a lock nut for tightening either the spark plug or pump into the adapter.

The lock nut has milled slots into which the spark plug proper is inserted until projections rest on a shoulder in the adapter beneath the lock nut. By giving the lock nut handle a quarter turn, the parts are locked. The Mayo pump is attached in a similar manner, by slipping it



into the slots in the adapter, and giving the pump a quarter turn, then applying the lock nut by a quarter turn to the left. Old style pumps can be equipped with the extra connection.

**CARBON REMOVERS.**

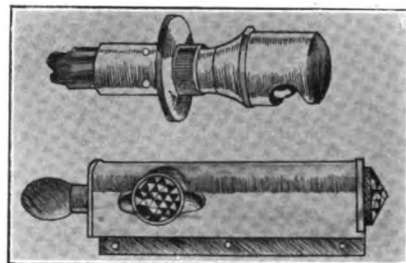
The motorist who attends to his own repairs is naturally interested in any accessory which lightens his labor and saves time. Carbon and other deposits are present in more or less quantities and the labor involved in removing these requires considerable time with the average motor; consequently, a large number of fluids have been marketed for this work.

During the past three months a number of moderately priced carbon removing equipments employing the oxygen process has been announced. Heretofore, the use of the method has been restricted to the repair shop and garage, owing to the initial cost of the outfit. Several manufacturers are now listing an equipment designed for the private garage.

**C-S REAR NUMBER LAMP.**

**The Culver-Stearns Is a Compact Electric Unit.**

The Culver-Stearns Manufacturing Company, Worcester, Mass., and Detroit, is marketing the style K rear



number light, which is designed to meet the demand for a lamp which will properly illuminate the rear number plate, and the maker states that the rays are so diffused that the numbers can be read easily at a considerable distance. While not made for a tail light, it is equipped with a small, but powerful, red lens.

The company is also making the style D combination dash and trouble lamp, which is so constructed that the lamp proper may be easily and quickly detached and employed as an inspection light. Suitable length of cord is provided, and the combination unit may be easily installed.

**GOODYEAR DETACHABLE TIRE.**

**Detachable Tread Securely Held by Inflation of Tire.**

The Goodyear Tire & Rubber Company, Akron, O., has brought out a novel tire, consisting of a regular tire carcass and a detachable tread. When the tire is deflated, the tread can be removed easily, yet when properly pumped up, the two parts have the qualities of a one-piece shoe. This makes it possible to replace either part in a few minutes. The tread is retained by inflation, and a secret construction provides the edges of the tread with a grip that excludes water or dirt. No mechanical fastenings are employed, and it is stated that the resiliency of the shoe is not impaired. The tread is built slightly square on the inside, providing air chambers at the two points of vibration on each side of the centre of the tread. This, it is stated, prevents injury by heating.

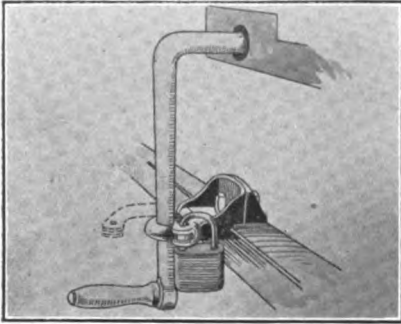




**FORD B. & W. CRANK LOCK.**

**Secures Starting Handle to Crankshaft of Motor.**

The Universal Manufacturing Company, Racine, Wis., is marketing the B. & W. crank lock, which is designed

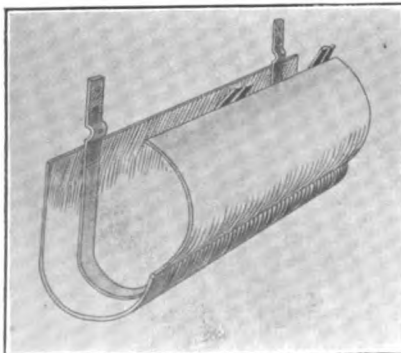


for model T Ford cars, and the maker states that it will positively prevent use of the machine by others than those intended. It comprises a clamp made in two sections, for attaching to the axle, and carrying a hinged shackle. The last named is operated much in the same manner as a pad-lock, differing in that a lock is employed for securing the movable portion of the hinge. When not in use the lock proper is moved downward out of the way of the starting handle. The B. & W. device is provided with two keys, constructed of sturdy material, and comes finished in black enamel. It is moderately priced.

**GLOBE GAS TANK COVER.**

**Made in Two Pieces and Locked by Winged Nuts.**

The Globe Machine & Stamping Company, Cleveland, O., is manufacturing the Globe gas tank cover, which is designed to enclose the Prest-O-Lite gas tank. It is made in two semi-cylindrical sections, which conform perfectly to the contour of the tank, and the material is durable. The sections are hinged, permitting the tank to be inserted and closed, and readily removed. One of the qualities of the design is that the straps are concealed, the only parts showing being the extensions, which are bolted to the running board or body. The two sections of the cover



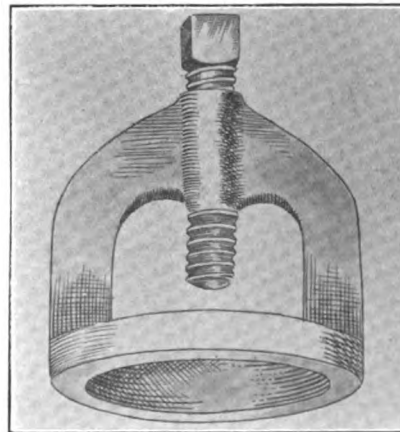
are locked together by T bolts and wing nuts.

The Globe cover is made for model B and model E Prest-O-Lite tanks. The first named is 20 inches long and 6.25 in diameter, and the E is 18 inches long and 6.25 in diameter. The finish is black enamel, baked on. The company also manufactures a cylindrical form with an open seam at the bottom. Both types save the labor of polishing the tank and add to the appearance of the machine.

**MONARCH WHEEL PULLER.**

**Designed for Removing Wheels of Ford Cars.**

The Benford Manufacturing Company, Mt. Vernon, N. Y., has brought out a wheel puller for the model T Ford automobile which is not only inexpensive, but is guaranteed to remove the most obstinate wheel with ease. The Monarch, as it is termed, is made to screw on the hub flange after the hub cap is removed, and is threaded up snug. The threads of the puller are so cut that it may be fitted by hand, and the maker states it will not stick or bind in service. The puller carries a set screw of



large thread, which is screwed up against the axle until snug. The leverage obtained is said to be very powerful. The Monarch, although light and compact, is designed to withstand severe service. The best of material is employed and each puller is carefully tested before being packed for shipment.

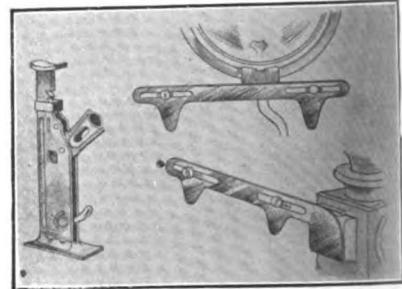
**POWER TIRE PUMPS.**

One of the noticeable features at the New York show was the addition of a power tire pump to the already complete equipment. It is but natural that this convenience should follow the universal adoption of demountable rims. Although the power tire pump was introduced last season, several manufacturers of it announce models adapted to the used car, some of which are moderately priced. The installation on the power plant does not necessarily involve alterations, it generally being possible to obtain the required drive from a convenient camshaft, pump shaft, etc.

**LIFTING JACK FOR FORD CARS.**

**An All-Steel Construction Which Is Very Compact.**

The Walker-Moore Manufacturing Company, Racine, Wis., is producing a special jack for the model T Ford



car, which is constructed entirely of cold rolled steel. One of the qualities of the jack emphasized is that the base and standard, also the rack bar and cap, are electrically welded. The pawls are case hardened and are carried on short, stocky rivets.

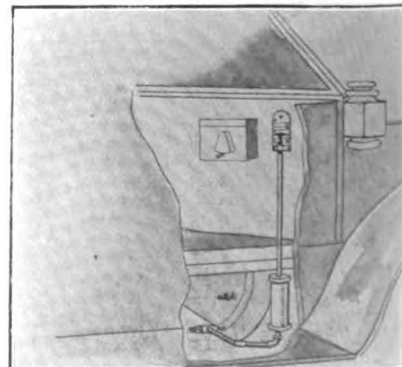
The entire mechanism of the jack is operated by a single spring, and the car can be raised by an upward movement of the lever, or lowered by a reverse movement. The maker calls attention to the light weight, compactness and durability of the tool, stating that it will lift easily 1000 pounds dead weight, and that it is capable of raising cars weighing 2000 pounds. The company also makes number holders for Fords.

**FORD DASH OIL GAUGE.**

**Cochran Design Indicates the Amount in the Crankcase.**

The Cochran Pipe Wrench Manufacturing Company, Chicago, is marketing the Cochran dash oil gauge for model T Ford cars. One of the qualities of the device is that it enables the driver to note at a glance the amount of lubricant in the crankcase, and without leaving the seat.

A brass pointer moves over a calibrated nickel scale. The maker states that there is nothing to get out of order and that there are no glasses to break or packing to leak. It is claimed that the equipment can be attached in a few minutes without drilling, etc., and that the best of material is employed throughout.

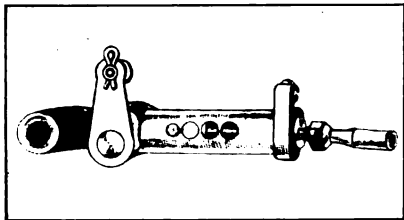




**EMPIRE FUEL ECONOMIZER.**

**Automatically Regulates Supply of Gas and Air.**

The Brown-Taylor-Greene Company, Chicago, is manufacturing the Empire gasoline economizer, which

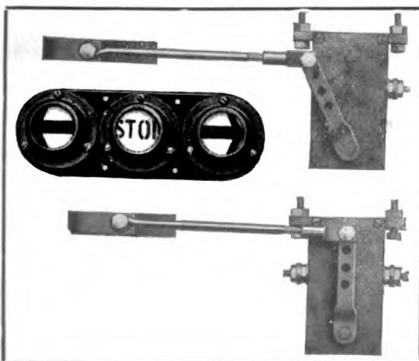


differs from the conventional types in that the control of the auxiliary air is automatically regulated in proportion to the speed of the motor. This feature is obtained by the connection of the economizer to the throttle linkage. The maker points out that with some types of carburetors too rich a mixture is supplied at low speeds, and that the Empire so regulates the air and gas as not only to provide efficient proportions, but also to effect considerable economy. Claims of 20 to 80 per cent. in fuel economy are made. The device is very compact, and the control of the air is by suitably proportioned ports, which are uncovered by a piston or plunger.

**J-M MOBILITE SIGNAL LAMP.**

**Indicates to Approaching Vehicles the Course to Be Taken.**

The H. W. Johns-Manville Company, New York City, is marketing a practical compact signalling device, which is utilized to warn approaching vehicles of the direction to be taken by the machine, and provision is also made for notifying the other car when a stop is to be made. The new light is known as the J-M Mobilite signal lamp, and consists of three small electric lamps mounted on an aluminum base finished in ebony black. When the steering wheel is turned to the right or left, a white arrow automatically appears in the corresponding lamp, indicating the direction the car will proceed. When the clutch is thrown out, the word "Stop" appears in red letters in the centre dial of the device.



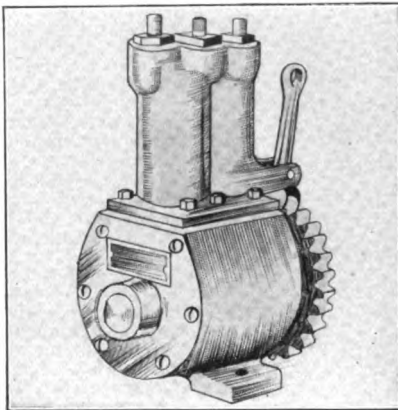
The signals are operated by self-contained, water proof contact devices attached to the steering gear and the clutch. Each unit comprises a vulcanized rubber socket fitted with a special tungsten bulb and a powerful reflector. The lamps consume but little current, and can be operated economically on dry cells. An illustrated booklet on the lamps will be mailed free on request.

**MASTER POWER TIRE PUMP.**

**Constructed for Large and Small Motor Cars.**

The Hartford Machine Screw Company, Hartford, Conn., is manufacturing the Master power pump, which is constructed in single and double-cylinder forms. One of the qualities of the pump is that no packing is utilized. It is also stated that the design prevents oil or other foreign substances being pumped into the tires.

The pumps are of the air-cooled type, enclosed construction, and the working parts are lubricated by an automatic splash system. The inlet valves are of the flat type, hardened and ground, and the outlet is of the ball design. The pistons are made extra long. The crankcase is an



aluminum alloy, cylinders are of special gray iron, and the connecting rods of bronze. The bearings are bronze lined. The pumps may be efficiently operated at any speed from 350 to 800 revolutions a minute, although one of 600 is recommended. At this speed it is stated that the pump will inflate a 37 by five-inch tire to 100 pounds in less than three minutes. The single-cylinder design is intended for small cars, and both are held to be very efficient.

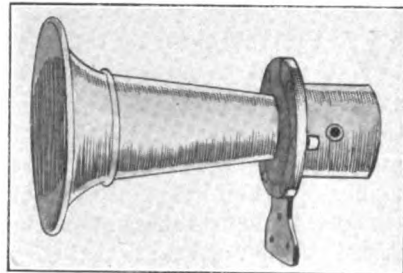
**FUEL ECONOMIZERS.**

The rapid rise in the price of motor fuel has been largely responsible for the large number of fuel economizers marketed during the past year. The majority of these devices admit and control a supply of auxiliary air to the intake manifold, and many are operated from the dash, providing the convenience obtained with the modern types of carburetors, that of regulating the mixture from the seat.

**REXO II ELECTRIC HORN.**

**New Product of Dean Electric Company is Inexpensive.**

The Dean Electric Company, Elyria, O., which concern has marketed a number of electric signalling devices,



has augmented its line with a new design which is termed the Rexo II. One of the features of the horn is that the retail price is less than \$4. The company has incorporated in the new signal the same high grade workmanship and material for which the product of this concern is noted, and states that the low price is due to the fact that a production of 100,000 is planned.

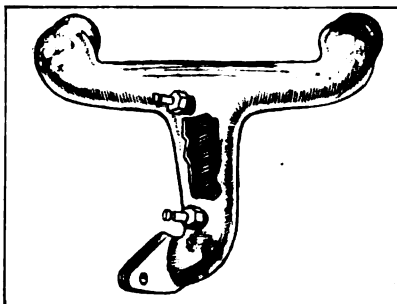
The Rexo II is finished in black and nickel or black and brass. Two coats of baked enamel are applied by a special process. It has a six-inch bell and is quadruple plated. Suitable length of cord and push button accompany each horn.

**ARNOLD ELECTRIC PLUGS.**

**Heat Coil in Intake Pipe Facilitating Starting of Motor.**

The H. W. Johns-Manville Company, New York City, is now marketing the Arnold electric heating plugs, which are held to solve the starting problem when the motor is exposed to extreme low temperatures. The complete equipment comprises two electric plugs and a resistance coil, the latter being inserted in the intake manifold. The location of the plugs is clearly depicted in the illustration.

By passing a current through the coil a high degree of heat is obtained, resulting in raising the temperature of the mixture to a point for complete and instantaneous combustion. This overcomes the tendency of the fuel to condense in cold weather and makes starting easy. The terminals of the plugs are connected through a switch to a six-volt battery.





## BUSINESS CONDITIONS AVERAGE WELL.

### National Chamber of Commerce Finds the Situation Is Improved at the Close of the Year---How Various Industries Affect the Several Sections.

**W**ITH the close of the year, 1913, there appears to be a generally hopeful situation with regard to business in practically every section of the country, judging from the statements made public by men who are conceded to be leaders in their respective fields. This same optimistic view is reflected in the publications devoted to finance and so-called market conditions. The Wall Street Magazine contends that the period of depression has been passed, and that it is now simply a question of how long it will take for business to resume its normal tendency.

The most elaborate review of the situation during the closing weeks of 1913 is that prepared by the committee on statistics and standards of the Chamber of Commerce of the United States of America. This report is a summary of general conditions, all as of one day, Nov. 29, from facts gathered by a corps of trained and competent observers all over the country. The dependability, accuracy and impartiality of these observers is said to have been thoroughly established by a quarter of a century of experience. The statement is divided by sections of the country that are in general closely related as to natural conditions and resources.

The map accompanying the statement purports to give the condition of business as good, fair and poor, for the entire country. Conditions are described as good in the whole of Maine, New Hampshire and Vermont, and in sections of Pennsylvania, Virginia, North Carolina, Alabama, Mississippi, Tennessee, Ohio, Indiana, Michigan, Wisconsin, Minnesota, Iowa, Montana and Idaho. It will be noted that fair conditions prevail generally and that the "poor" sections are decidedly limited in comparison. A summary of the report follows:

#### **The Pacific Coast.**

Generally fair conditions prevail throughout Oregon, Washington and California. Small grains suffered some damage in eastern Oregon because of drought and hot winds, and in California were seriously affected by lack of rain at a critical time. The yield in Washington was on a parity with 1912. The fruit crop was not so large in eastern Oregon and Washington, but commanded a higher price. The cattle and sheep industry is in fair shape owing to good demand and high prices. This is true likewise of the dairy industry, which is growing fast. Lumber is very quiet, because of low prices and small demand. The salmon pack in Washington and Oregon was both large and profitable. Northern California is entering on a period of great development and is filling with settlers very rapidly. The severe freeze of last season in southern California was in the nature

of a calamity to the citrus growers, but the outlook this season is most excellent.

#### **Rocky Mountain States.**

General conditions in Montana are most promising and the state seems to be entering upon a period of great prosperity and development. The grain crops as a whole were very good. Crops in Utah and Idaho were generally good. Sheep and wool industry is only fair, cattle somewhat better, and the usual story of a poor demand for lumber prevails. The dairy industry runs from fair to good, and while the fruit crops were not so large they have been marketed at good prices.

The situation in Wyoming is generally analogous to that in Idaho and Utah, but the state is slowly recovering from several years of bad crops. Oil industry is in good condition. Conditions in Nevada are only fair as a whole. Agriculture is a comparatively small industry, and the state is slowly recovering from a slump in gold mining.

Grain crops in Arizona and New Mexico, while comparatively small, were very good, and agriculture comes more to the front as irrigation projects are completed. In Colorado, mining was formerly the principal industry, but of late years has been supplanted in importance by agriculture. Grain crops were fairly good, but there were two previous years of shortage to make up. The fruit crop was good as a whole and commanded good prices. Gold mining is fair. Labor strikes have upset the coal mining industry. Lumber and cattle range from poor to fair.

#### **Great Plain States.**

In both North and South Dakota spring wheat, one of the principal crops, was seriously affected by drought last summer. Corn was somewhat less than in 1912. Cattle and sheep in both states are in small supply, but are bringing good prices. Hog raising is suffering seriously from the prevalence of cholera in South Dakota. Fall plowing is being pursued under favorable conditions.

Crops in Nebraska, as a whole, were below the average, with the exception of wheat, which was a large crop. Cattle and sheep industry centres principally in western Nebraska, and the condition ranges from poor to fair. Manufacturing is in good shape and poultry industry flourishing.

Agriculture suffered severely in Kansas and Oklahoma, because of abnormal heat and drought. The Kansas wheat crop was large, but only moderate in Oklahoma. Cattle, hogs and sheep are scarce in both states, having been largely shipped to market because of lack of feed and its high price. Oil industry in northern and eastern Oklahoma is in fine shape. The cotton crop in Oklahoma has proven larger than anticipated. Mining is poor in Oklahoma, but fairly good in Kansas.

#### **The Northwest.**

General conditions in Minnesota and Wisconsin are unusually good. Crop yields were large and profitable. Dairy industry is growing steadily in importance, and is in a most excellent condition. Mining is fair, as is also manufacturing.

#### **The Central West.**

Crops in Iowa suffered largely from drought. Mining is generally good, as is also the poultry and dairy industry. There is a large demand for tile and cement, and it is noticeable that nearly every town and village is laying down concrete sidewalks. One of the serious problems of the state is the very high price of land, and the inability to get good farm land at moderate prices.

Illinois suffered much in an agricultural way from the heat and drought, though the wheat crop was unusually large. Coal mining and manufacturing vary from fair to good. The crops in Indiana were fairly good. The wheat crop was particularly good. Factories, according to the kind and locality, are running from one-half to full time.

Crops in Missouri, outside of wheat, suffered much from drought, but the loss was largely minimized in



many sections by the application of dry farming principles. Cattle and sheep industry is fair, but handicapped by the high price of feed. Peaches were an abundant crop, apples only moderate. The poultry industry continues good. Missouri leads all the states in the value of poultry, the surplus production being something like \$45,000,000 annually, the sale of eggs being something like 150,000,000 dozen.

Ohio was not much affected by the drought, but the effects of the floods in the southern portion have not entirely passed away. As a whole the state is in excellent condition. Michigan conditions are generally very good. Crops last year were better than the average, save that of fruit. The cattle industry is generally good, and this is likewise true of dairying. Canning industry and furniture manufacturing are excellent.

#### New England.

Potatoes, which are an important crop in Maine, are good. Lumbering is fair, and dairy industry good; that is true likewise of stone and marble quarries. Many of the large hardware manufacturers in Connecticut are running from four to five days a week. The shoe industry is good, textile industry is only fair. The conditions are much mixed.

#### The South.

Reports from Maryland as to crops, manufacturing and coal industry are generally good. Coal mining in West Virginia is suffering from strikes, though good in spots. Crops in Virginia are fair. Dairy farming is in good shape, and tobacco industry is excellent. The peanut crop, which is an important one in the southeastern portion, is reported quite good.

Crops as a whole in North Carolina were fair. Truck gardening, which is one of the principal industries in the eastern section, was very good. The yield was excellent and the prices remunerative. The cotton yield in South Carolina, while damaged by rains to some extent, promises larger than in 1912.

Conditions in general in Georgia were much better this year than last. Truck gardening in Florida is good, and the outlook is excellent for a good crop of oranges, lemons and grape fruit. Dairy industry is growing in importance and is in good shape. The cotton yield is in excess of 1912. Crops were good in Alabama.

Mississippi, as a whole, is in much better shape than last year. Cotton yield has been good. Sugar cane production in Louisiana promises to be very good. The rice crop is large. Corn is good and this is also true of cotton.

Crops in Kentucky were seriously affected by drought, wheat being the principal exception. A curious and interesting effect of public sentiment on business is shown by the depression in the Blue Grass region because of the lack of demand for racing stock, due to the fact that laws in many states prohibit betting on races.

Cotton yield in Tennessee is considerably larger than last year. Conditions are much mixed in Arkansas. Cotton yield is larger than last year. Rice industry is in fair shape. Corn as a whole is good. Coal mining is good. Poultry is of most excellent quality, manufacturing varies from fair to good and cattle are generally good. Cotton in Texas is a smaller crop than last year. Sugar cane in eastern portion is in good shape and there is a large crop of pecans. Dairy industry is in good shape and improving.

#### Middle States.

Crops were generally good in Pennsylvania, but the iron and steel industry is suffering from lack of orders. There is a general belief that there will be an increase in demand in the late winter and early spring to replace the fast depleting stocks in the hands of wholesale and retail dealers. Electric manufacturing interests are running on about three-fourths time. Anthracite coal industry seems well employed. Bituminous coal is fair. The oil and gas industry is in excellent condition.

Such crops as were raised in New Jersey were fair

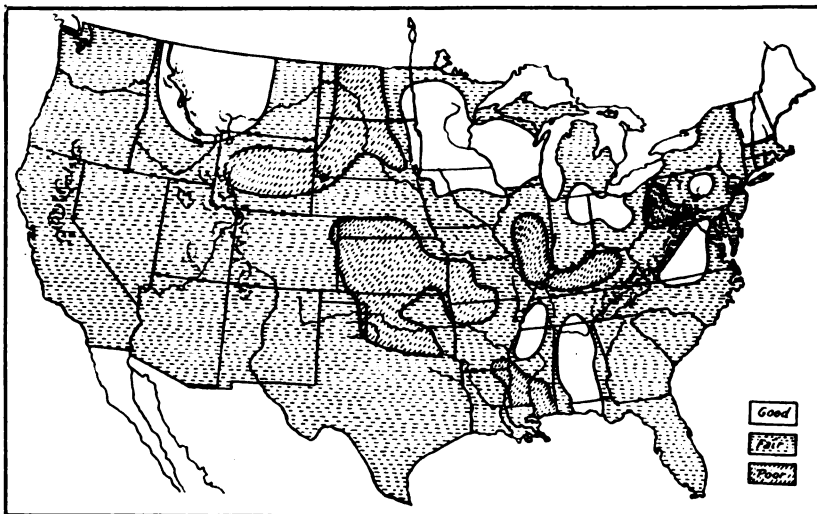
and truck gardening was very good. Silk mills are suffering from strikes and their business is reported as poor. Machine shops vary from fair to good. The extensive leather interests seem to be doing well.

In New York the crops were not up to the average. Fruit, which is a very important industry, was damaged by frost, and other crops by drought. Canning factories are well employed.

#### General Conditions.

Any general statement as to condition of manufacturing throughout the United States would at present be both misleading and inaccurate, since this condition varies according to the locality and the nature of the product. The textile industry is adjusting itself to changed conditions resulting from decrease in tariff rates, but the effect so far does not justify previous apprehensions. The paper manufacturing business is below normal, while shoe manufacturing is good, with a prospect of an advance in prices. This is true likewise of the leather tanning business. All manufacturing connected intimately with the railroad, and with the steel and iron industries, is necessarily feeling the depression of these two great branches of business.

Throughout the central west, despite the drought, there is a general feeling of hopefulness for the future. This seems to be partly due to the very fine prospects of the growing winter wheat and to the hope and belief that many of the serious political and economic questions, that have created such disturbances in the past,



Map Prepared by Chamber of Commerce of United States of America, Showing Business Conditions at Close of Year.

are now in a fair way toward solution. In general it must be remembered that the average man in the small town and on the farm is more interested in local business conditions and their outcome, than in those large national problems which seem of such dire portent to the large interests and to capital.

Throughout the southeastern Atlantic states, mercantile business is in good volume, and this is true in general throughout the West and the South. Business varies much in these sections, according to the locality. Where crops were good, business is fairly active; and in sections where crop returns last year were poor, business is correspondingly quiet.

The Royal Automobile Club of Austria is arranging for a series of automobile races on snow and ice in January and February. Ten classes have been proposed, each to compete in three tests: Driving over frozen stretches on the level and on inclines; driving over an ordinary firm sledging path, and driving over loose snow.

The Society of Motor Manufacturers & Trades of Great Britain will hold an aero, marine and stationary engine exhibition at Olympia, London, March 16-25.

The third annual Tour de France will be held under the auspices of L'Auto de Paris, March 1-25. The distance to be covered is 3750 miles.



## HINTS FOR NEW CAR OWNERS.

### Adjusting Pinion and Gear of Cadillac Rear Axle---Resetting Carburetors on Models 24 and 25 Buick Cars---Timing National Motor.

**N**OISE in the rear axle is generally due to the wear of the bearings, which alters their original relative positions. When these gears are adjusted at the factory unusual care is taken to insure that the large ends of the teeth of one gear will be practically flush with those of the teeth of the other. Extreme care must be exercised in the adjustment of the gears as the most accurately cut forms may be easily spoiled by service when not properly adjusted.

In the rear axle of the 1912 Cadillac provision is made for adjusting the pinion and gear so that their teeth may be correctly meshed, and in an accompanying illustration is presented a

clamp bolt J. With the last named loosened, the adjusting nut K may be rotated until all play is eliminated, but care should be exercised not to have the bearing too tight. It should be borne in mind that Timken bearings will revolve even when adjusted too snugly. They should be adjusted so that a very slight amount of play or looseness may be discerned. If in adjusting it is found that the slots in the locking nut do not match or register with the locking plates, it is preferable to slack off, rather than to tighten. All Timken bearing adjustments have right hand threads.

After adjusting the driving shaft, if it should

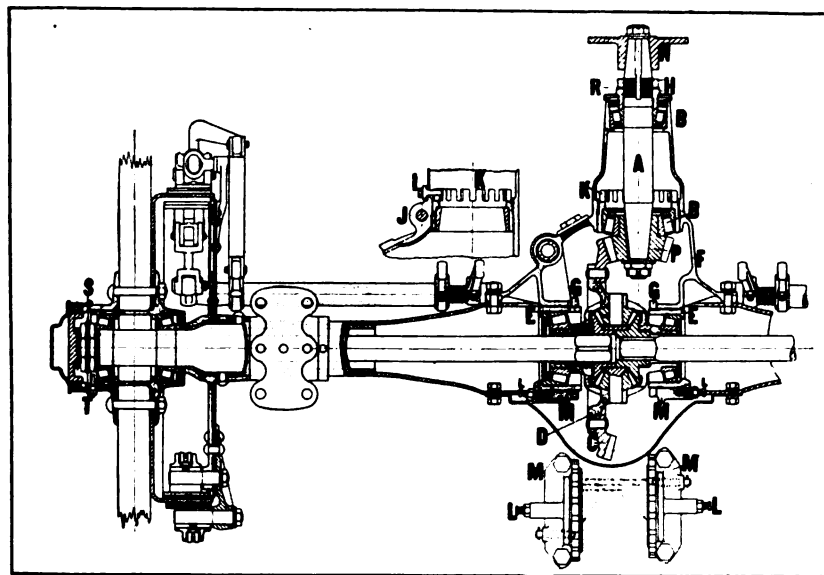
be found that further alteration is required to bring the gears into proper mesh, it must first be determined whether it is necessary to move the drive shaft toward the axle or the large bevel gear toward the pinion, or both.

If adjustments are made with the axle removed from the car, as in the overhaul of the chassis, it is suggested that it be placed right side up to conform to the references made herein. By right is meant facing the rear of the chassis.

If the adjustment of the drive shaft does not obtain the proper relative positions between the pinion and large gear, and it is necessary to move the shaft back toward the axle,

loosen the clamp bolt J, remove the locking plate I, then loosen the nuts H. Next turn up the adjusting nut K, a notch at a time, until the proper position of the shaft is secured. The adjusting nuts H are next turned, and the forward nut brought up tight against the lock washer R. Care must be exercised not to adjust the bearings too tightly as previously explained.

The large bevel gear C is attached to the mount D, which has a hub projecting on each side that fits into roller bearings. These bearings are carried in sleeves, E, supported in



Sectional View of Rear Axle of 1912 Cadillac with Components Lettered for Simplifying the Work of Adjusting Gears, Etc.

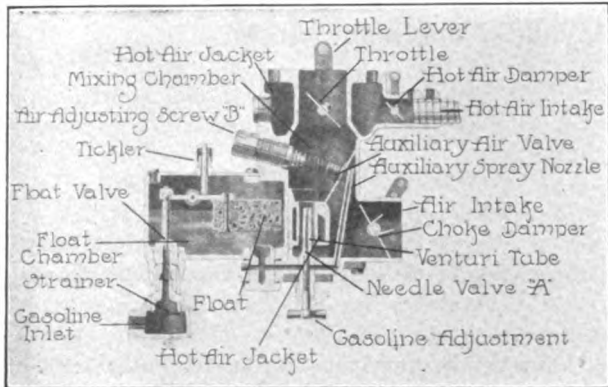
longitudinal sectional view of the axle with the components lettered. The maker of the axle makes an excellent suggestion for testing the mesh of the gears after adjustment, recommending the use of a crank to rotate the driving pinion shaft A. This permits of correcting any improper adjustment before replacing the axle under the car.

End play of the driving shaft, due to wear of the bearings, may be eliminated by taking off the locking plate I, which covers the opening in the bearing carrier. This will permit access to the adjusting nut K, which is retained by the



the main carrier F. The sleeves are threaded on their inner ends to receive the adjusting nuts GG.

To adjust the gear C, loosen the bolts retain-



Sectional View of Marvel Carburetor Used on Buick Cars, Showing Components for Making Adjustments.

ing the caps M and M, and draw the locking plungers out of their slots in the adjusting nuts GG in the sleeves which support the bearings of the gear mount. The nuts G and G are turned, moving the gear mount with gear in either direction as required. In making these adjustments it is recommended that a certain amount of backlash or play be allowed, to prevent the teeth binding. After completing this work all nuts, etc., should be locked securely.

The set screws LL in the cap should be adjusted so that they will set only very lightly against the edge of the hole in the housing, and locked in this position.

### BUICK CARBURETOR.

Models B 24 and B 25 Buick cars are regularly equipped with the model E Marvel carburetor, which is adjusted at the factory, but generally it is changed or must be altered for climatic reasons, after cleaning, etc. A sectional view of the carburetor is shown in an accompanying illustration, with its components lettered.

To readjust the Marvel, the needle valve A is turned to the right until it seats. Do not exert undue pressure, as the valve is delicate. Next, turn the air adjustment B to the left until closed. With these components closed, begin by adjusting the air, turning the screw B three complete turns to the right, and open the needle valve A two complete turns, rotating it to the left. Start the motor and note its operation.

Generally the fuel adjustment A will have to be slightly altered to obtain proper idling with the throttle closed, and in this respect the posi-

tion of the butterfly valve must be considered. A throttle stop is provided under the throttle lever for this purpose. In cutting down the fuel supply, move the needle but slightly.

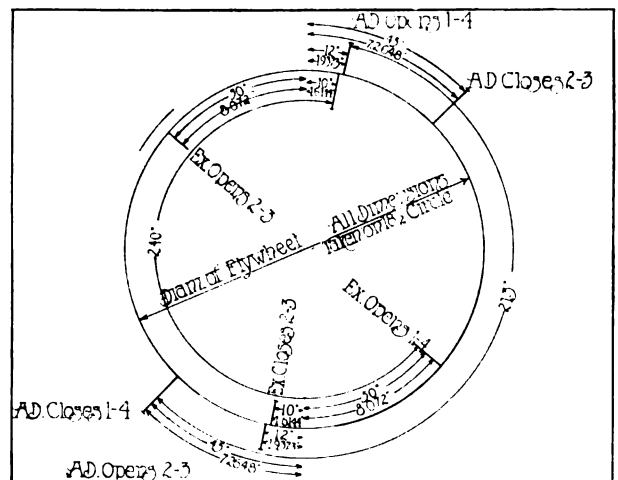
After the motor has become warm, rotate the air valve adjusting screw B to the left, a little at a time, until the motor slows down, then turn to the right until satisfactory running is obtained. Rotating the screw B to the right cuts down the supply of air; to the left decreases the tension of the spring and admits more air.

If the adjustments are correct, the exhaust should be free from offensive odors and the motor should respond quickly when the throttle is opened wide. Back firing indicates too little gas and the needle A should be opened.

The choke damper is adjustable by a screw in the lever, and this can be set for any desired relation between the damper and the throttle. Ordinarily the hot air damper should be nearly horizontal when the throttle is closed.

### NATIONAL TIMING DIAGRAM.

The proper method in adjusting the space between the tappets and the valve stems of a motor is to check the opening and closing points of each valve by the marks on the periphery of the flywheel. This is to be preferred to the making of measurements as with a card, for example. An accompanying illustration shows the timing diagram of the four-cylinder motor having a bore of 4.875 inches and stroke of six used on the National M. C. C. touring car. As the opening and



Valve Timing Laid Off on Flywheel of Motor Used on National M. C. C. Touring Car.

closing points are laid off on the flywheel owners of this type of machine should be able to check the timing, as well as to replace camshafts.



## WITH THE MOTORING INTERESTS ABROAD.

### Great Britain Is Much Interested in Electric Vehicle—New Arrol-Johnston Electric Is Announced—Details of 12-Cylinder Sunbeam Motor.

ONE of the results of the official visit of members of the British Institution of Automobile Engineers to this country last summer is the increased interest in electric equipment of all kinds in Great Britain. This has its application to electric lighting and motor starting for gasoline machines, but it also means that more decided attention has been given to the possibilities of the electric vehicle, both for passenger and commercial use.

Just at present there is well defined conviction that an electric car can be used to good advantage in touring the British Isles. It is pointed out by those interested in the proposition that the better road conditions in Great Britain should make for greater success in this respect than in America. The principal handicap is held to be

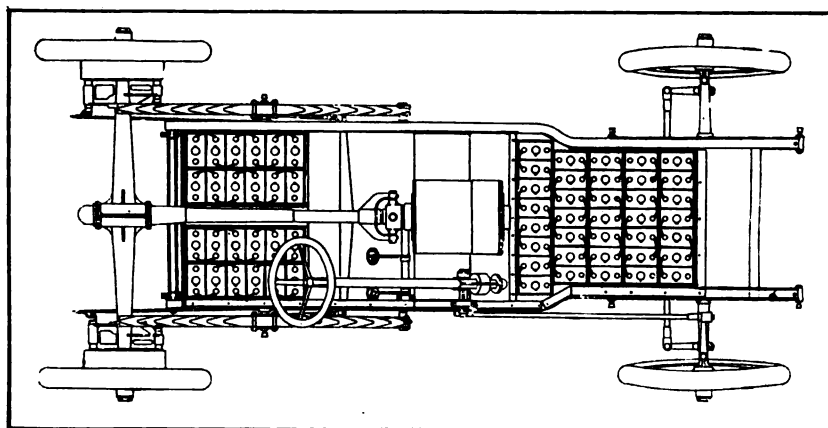
of those interested will result in a much more general use of electrics within a comparatively short time.

#### ARROL-JOHNSTON ELECTRIC.

#### Interesting Details of New Pleasure Car Chassis Produced by Scottish Concern.

Among the members of the British Institution of Automobile Engineers who visited America last summer was T. C. Pullinger of Arrol-Johnston, Ltd., Dumfries, Scotland. During his stay in this country Mr. Pullinger was particularly impressed by the electric vehicle end of the industry, and shortly after his return to Scotland it became known that Arrol-Johnston was busily engaged upon the construction of an electric pleasure car. Details of this chassis have been awaited with some little interest by Americans.

A plan view of the new chassis is presented herewith. The maker calls special attention to the method of spring suspension. The front members are of the usual semi-elliptic type, but the rear springs are of a special design, termed an inverted cantilever. The long springs are anchored to the side members of the frame at



Plan View of New Arrol-Johnston Electric Car, Made in Scotland.

the limited mileage obtainable from the storage battery, but it is proposed to eliminate this difficulty by the establishment of charging stations in the important centres.

At the same time, a movement is under way, in charge of a body representative of municipal engineers, looking toward a more general use of the electric town car and electric trucks in cities. It would appear that business men in England have given very little study to this phase of the situation, and the object of the present movement seems to be that of conducting a campaign of education, similar in many respects to that which has been conducted in this country by the Electric Vehicle Association of America, and allied interests. It is anticipated that the efforts

of those interested will result in a much more general use of electrics within a comparatively short time. The front ends merely rest upon pads projecting from the frame, and the rear ends upon the rear axle casing. Any lateral movement of the rear axle relative to the car frame is held to be prevented by the parallel motion.

It will be noted that the 60-cell Edison battery is divided into two sections, one being placed in front under a hood of normal appearance and the other beneath the rear of the body. Between the two is a series wound electric motor of the enclosed four-pole traction type, which runs normally at about 1200 to 1400 revolutions a minute. The motor is designed to withstand a temporary overload of 300 per cent.

The continuous torque controller gives five



forward speeds and three in reverse, and an off position in which the car runs free when pushed, but cannot be operated under its own power. Drive to the rear wheels is through a propeller shaft enclosed in a torque tube, and an overhead worm gear attached to the usual differential in the rear axle. There are two independent sets of brakes, both operated by the feet, which act directly on the rear wheels.

### NATIONALISM IN FRANCE.

#### Manufacturers Are Seeking to Establish Demand for French Made Products.

For some years there has been a decided tendency on the part of British motor car manufacturers and others to urge that the people of Great Britain shall demand British made products. The Spanish and Italian governments have carried the plan of encouraging home industry into the awarding of contracts, etc. It now appears that the French manufacturers are behind a movement in that country toward the nationalization of the production of all parts for the automobile.

This action is believed to have had its inception in the desire of French motor car makers to overcome the so-called American invasion. About a year ago several representatives of automobile manufacturers in France visited factories in the United States in order to obtain first hand information regarding American methods of production, and later it was declared that there was no practical means by which it was possible to compete successfully with American manufacturers in the production of low and medium priced cars, although a few makers announced that they were prepared to produce machines on the American plan.

Still later, it was announced that the French government had passed a measure calling for a special duty on all articles fitted to foreign cars which had their origin in France. That is to say, whenever an American car, for instance, was imported into France fitted with tires or other accessories bearing the name and made under patents held by French concerns, the special tariff would apply, even though the article in question actually were made in the United States or other country outside of France.

The latest move includes the establishment of French factories for the production of parts, accessories and equipment, heretofore purchased outside that country. A specific instance is that of wire wheels, which formerly were purchased from British makers, but are now being manufac-

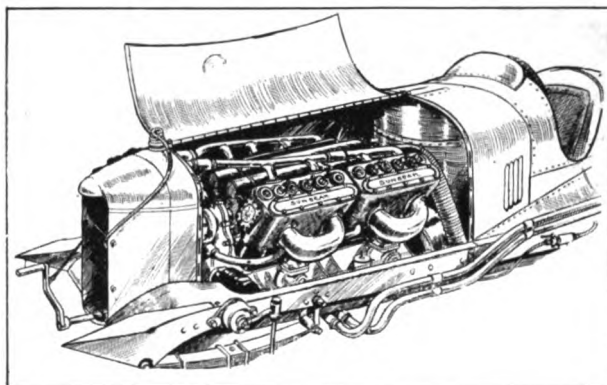
tured by a French concern. The same thing applies to magnetos formerly purchased in Germany. Some motor car makers go so far as to maintain that nothing enters into the production of their machines unless it is made in France.

#### GENERAL NOTES FROM ABROAD.

An accompanying illustration presents a line drawing of the new 12-cylinder Sunbeam engine, which has been designed by the Sunbeam Motor Car Company, Ltd., Wolverhampton, Manchester, England, to attack the worlds records on the road in France. The cylinders have bore of 90 mm and stroke of 150 mm (3.5 by 5.9 inches), and it is expected that the motor will develop a speed of 140 miles an hour. The two pipes leading to the rear of the car outside the frame are oil leads from and to the tank carried in the rear of the single-seated body. Dual rear tires will be fitted.

Those in charge of the arrangements for the annual North of England motor show in Manchester, Jan. 9-17, were confronted by a serious handicap last month, when the Exhibition hall, in which these shows have been held since 1911 and in which it was proposed to hold this year's display, was completely destroyed by fire. The Society of Motor Manufacturers & Traders immediately secured the City Exhibition hall, which is a much smaller building, for the forthcoming display.

An association of road engineers has recently been



**Twelve-Cylinder Sunbeam Engine, with Which New World's Records Are Expected.**

formed in Switzerland, the object being to make a specialty of road construction and to work in co-operation with the Swiss Automobile Club for improved highway conditions.

A recent report of the number of motor vehicles registered by the London county council gives the following figures: Pleasure cars, 101,198; heavy vehicles, 6345; motorcycles, 27,324; driving licenses, 303,021.

The Royal Automobile Club of Belgium has decided that the 1914 Grand Prix race in that country shall be a two-day event, the first day being reserved for large cars and the second for small machines. The dates have been fixed for July 26-27.

According to figures compiled by the Automobile Club of Canada, there were 44,278 motor cars and motorcycles in use throughout the Dominion, Nov. 1, as against 31,865 on the same date in 1912, an increase of over 12,000 in 12 months.

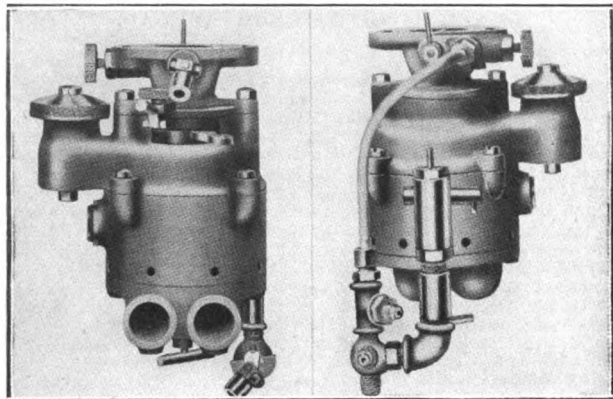
Entries at the original fee for the 1914 Tourist Trophy race of the Royal Automobile Club of Great Britain on the Isle of Man, closed Dec. 1, at which time the following cars had been entered: Minerva, three; Humber, three; Straker-Squire, two; Sunbeam, three; Star, two; Vauxhall, three; Martini, one; Adler, three; Pipe, three. Entries at double fees will be received until March 31.

In France the motor car tax for 1913 was paid on 90,959 vehicles, as against 76,771 in 1912. The cars mentioned are all of the private type, cabs, buses and commercial vehicles not being included.



## THE KNOX MODEL E KEROSENE CARBURETOR.

**F**OLLOWING exhaustive experimentation covering a period of nearly three years, supplementing an engineering knowledge developed



The Knox Kerosene Carburetor, Showing the Construction from Either Side.

by years of practical work, the Camden Anchor-Rockland Machine Company, Camden, Me., has perfected a carburetor designated as model E, which is designed to use with kerosene fuel in all internal combustion engines. The company has manufactured carburetors more than 12 years and half that time has experimented with kerosene carburetion, the possibilities of economies through the use of that fuel having prompted unusually careful investigation.

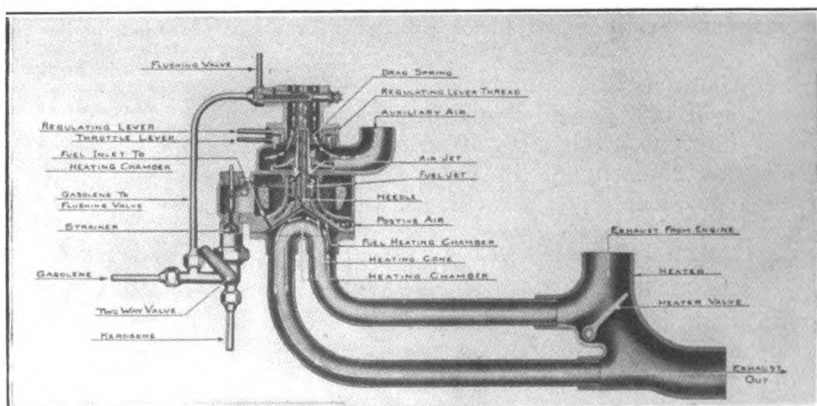
The company, three years ago, because of the demand from its foreign trade, began the production of a carburetor designed to use either kerosene or gasoline, and in practical service this instrument gave excellent satisfaction. The increasing cost of gasoline and the comparatively smaller price of kerosene prompted further investigation, with a view of utilizing the latter fuel constantly, aside from starting, and early in 1911 E. P. Lamb, the company's experimental engineer, began development of a carburetor that would be equally efficient for automobile and tractor motors and stationary and marine engines. The results obtained have been in every way gratifying, and such efficiency has been realized in continued service that the company has made plans for producing the instrument to meet any demand that can be

reasonably anticipated for hydrocarbon engines.

The carburetor is so designed that the engine may be started with gasoline, which insures operation in coldest temperatures, and then kerosene is used that is gassified by heating the base of the instrument from the exhaust. An explanation of the operation of the carburetor is given by the company's engineer as follows:

The fuel is admitted to the carburetor in the usual manner. In the base of the carburetor is a conical shaped heating chamber. The heat is derived from the exhaust line and the temperature is regulated by a damper or valve in the exhaust pipe that is shown in the accompanying illustration. This damper is controlled from the dash. As the chamber in which the fuel is heated is of such capacity that the fuel will flow over the cone, which is made of soft copper and has a large heating surface, no accumulation of kerosene follows and the fuel is transformed to gas as it passes the needle valve, which is maintained to be the only correct method of carbureting kerosene.

The needle valve and the nozzle are peculiar in construction. The gassified fuel passes the regulating needle into the nozzle through a series of very fine holes, and the heated constant air is supplied to the nozzle through a second series of small orifices. The nozzle is so constructed that the fuel holes intersect the constant air holes at the outlet point, a condition that insures atomization of the mixture as it enters the mixing chamber. The needle valve and the nozzle are adjustable and can be raised or lowered by



Cross Section of Knox Kerosene Carburetor, Showing the Principles of Operation and the Manner of Heating from the Exhaust.

the movement of the throttle lever. The auxiliary valve that controls the additional air supply serves as a throttle. No other control is needed.



The qualities of the carburetor, for which special claims are made by the maker, are protected by patents, and these include the method of heating the fuel, the method of increasing the speed of the gases and the method of thoroughly atomizing the mixture. The carburetor is so constructed that either gasoline or kerosene may be used, but for convenience it is built with a flushing valve and the gasoline is not passed through the carburetor. When the motor is first started the fuel is gasoline, supplied by opening the flushing valve, this valve having a needle regulation and being controlled from the dash. After the engine has been run from 15 seconds to three minutes, depending upon conditions, the flushing valve is closed and the kerosene fuel is drawn upon without change in the regulation.

The maker claims that a gain averaging seven per cent. is made in speed and power when using kerosene, as compared with gasoline, and with practically the same volume of fuel; that further, the standard automobile motors can be operated successfully with kerosene fuel, demonstration of this efficiency leading to extensive tests for some of the motor manufacturers; that when fitted to marine motors the model E carburetor is decidedly superior to the model D instrument, and that in ordinary conditions the marine motor can be started cold with kerosene by priming it well with gasoline. When used with gasoline as fuel the statement is made by the maker that the carburetor, because of its consumption and method of vaporizing, will deliver a mixture to the motor superior to that of any other carburetor, increasing the power and decreasing the fuel consumption. The saving with kerosene as fuel instead of gasoline is the difference in price. The company is now building an addition to its plant and has ordered special machinery for the manufacture of these carburetors, and will shortly produce them in standard sizes of one, 1.25 and 1.5 inches, to supply the manufacturers and the trade.

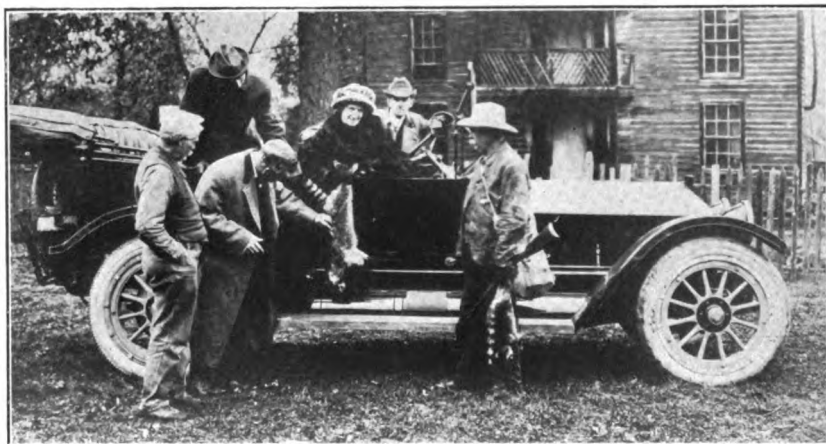
H. J. Rogaly, Port Elizabeth, South Africa, agent for Hupmobile cars made by the Hupp Motor Car Company, Detroit, recently completed his third tour of the South African Union in a machine of this make. The object of these trips

has been to bring the merits of the automobile to the direct attention of the people in sections where motor cars have not been known hitherto, and to demonstrate the ability of the Hupmobile to negotiate the prime roads of these districts.

### HUNTING BY AUTOMOBILE.

#### San Francisco Enthusiast Gets Unusual Enjoyment with His Knox Car.

An accompanying illustration shows Samuel W. Crim, San Francisco agent for Knox cars, made by the Knox Automobile Company, Springfield, Mass., and a party of friends returning from a day's hunting trip. Mr. Crim is a busy man, as are all the automobile dealers in San Francisco, but he manages to steal away



Samuel W. Crim of San Francisco and Hunting Party in Knox Car.

from business for a day of his favorite sport, once in a while. He declares it is nothing new for Californians to utilize their machines in this manner.

In fact, he maintains that the California owner of an automobile uses it constantly whether at work or at play. He considers it only natural that a car should be just as much a part of the hunting equipment as the gun. By getting an early morning start it enables him to go into the remote sections for several hours of rambling in some of nature's most glorious hunting regions, and still get back for a good night's sleep in his own bed.

"We Californians believe the automobile was made to be used", he says, "and whether it is hunting or just roaming about town, we do not intend to let the motor get rusty from lack of use".



## WITH THE CYCLECAR MANUFACTURERS.

### Detroit Cyclecar Company in Serious Trouble—Charles Merz Enters the Manufacturing Field—Details of Cricket and Latest Woods Mobilette.

**I**T IS extremely unfortunate that the remarkable interest in cyclecars has created a situation as a result of which it has been possible to work upon the speculative instinct in a manner capable of discrediting an industry of less stability than the manufacture of automobiles. This is particularly true, inasmuch as there are many in the industry who share the opinion of the public that there is a promising future for this type of machine.

The Automobile Journal has repeatedly urged caution on the part of both prospective purchaser and manufacturer, because it has appeared essential that the first machines of this new type which are put into general use shall be as nearly practical as it is possible to make them. It must be assumed that there will remain certain details of construction and application of well defined principles which must be worked out after the original designs have been tested in actual service.

It is believed that for the most part those engaged in exploiting the cyclecar are honestly endeavoring to supply a demand which appears decidedly insistent. That there are at least a few who seem to be quite as much interested in the disposal of stock as in the production of machines also is evident. Therein lies the greatest danger to the immediate success of the cyclecar.

As the result of an investigation by Irving Coffin, county detective, of Detroit, a warrant has been issued by Police Justice Matthew S. Gainer of that city, charging Phillip H. Cale, formerly second vice president and a director in the Detroit Cycle Car Company, with the disposal of 10 shares of that company's stock, although the company had not complied with the statute requiring the filing of particulars as to its assets, liabilities and plans with the state securities commission. The statute in question is the so-called "blue sky" law, passed at the last session of the Michigan legislature, and is similar in many respects to that now in force in other commonwealths.

The prosecutor has seized all the books and papers of the concern. It is stated that of the \$350,000 in capital stock, \$247,000 was assigned to Arthur B. Thomas, president of the company, in payment for two patents held by him, one for

an oiler and the other for a radiator. Thomas is said to have assigned \$25,000 of this stock to one Hall, and Cale is alleged to have disposed of this in lots of 10 shares at \$100 a share. It is expected that the defense will claim that it was not violating the statute in question because Cale was not selling stock for the company, but for Hall.

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#### FAULTLESS FROM SAGINAW.

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#### Valley Boat & Engine Company Is Giving First Car Its Road Test.

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While the Valley Boat & Engine Company, Saginaw, Mich., has not yet made public the complete details concerning the cyclecar upon which it is working, it is anticipated that it will bear the same name as the Faultless power boats, in the production of which it is somewhat distinguished. The first machine is undergoing its road test, and it is stated that it has been averaging about 50 miles to the gallon over the ordinary Michigan country roads, and between 25 and 30 miles an hour on long drives. A second car is now being built, to which a body will be fitted, the test machine having been turned out with chassis only.

The car is to be equipped, according to present plans, with a two-cylinder, air-cooled V type motor, with bore of 3.375 inches and stroke of 3.875. The flywheel is located amidships and serves the purpose of the friction disc. This puts practically the whole of the driving mechanism under the seats, which will be a trifle staggered, the driver being about nine inches ahead of the passenger. The wheelbase will be 100.5 inches and the tread 36. Wire wheels will be used with 29 by 2.75-inch non-skid tires.

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#### MERZ ENTERS THE FIELD.

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#### Well Known Racing Driver Announces a New Friction Driven Model.

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Charles C. Merz, well known in the industry as a driver of National and Stutz racing cars, and for many years connected with the engineering and experimental departments of the National



Motor Vehicle Company, Indianapolis, Ind., is interested in the production of the Merz cyclecar, shown in an accompanying illustration. This will be built in the two-passenger, tandem design and as a light delivery vehicle, by the Merz Cyclecar Company of Indianapolis. It is understood that this concern has acquired a concrete factory building at 1417-1421 Southeastern avenue.

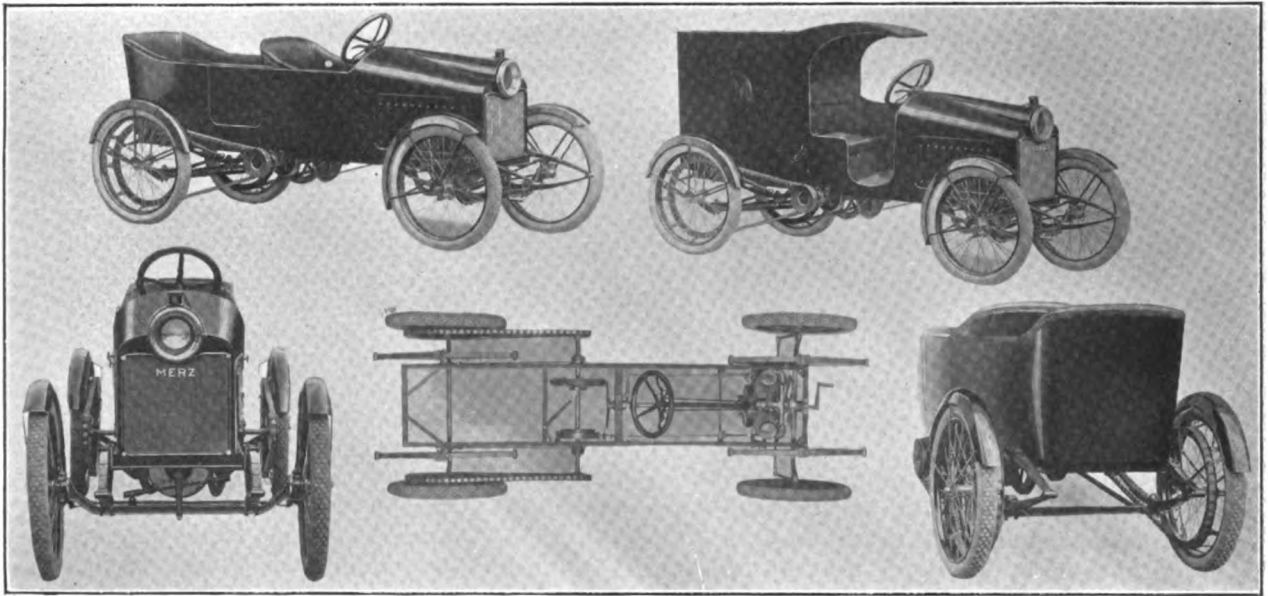
Merz is said to have been experimenting with the new product for the past year, and is now convinced that the machine is capable of taking one or two persons anywhere that an automobile can go. The wheelbase is 84 inches, and the tread 40. The weight is not given, but the maker states that tests have indicated that it can be

screen to allow free air circulation, and the screen, as well as the ventilation doors on the sides of the hood, is removable to permit easy access to the motor.

#### NEW SCHEBLER CARBURETOR.

##### Modification of Motorcycle Type Designed for Use with Cyclecar Motors.

Consideration of the specifications for cyclecars now being produced by American manufacturers indicates that a large majority of them have decided upon the Schebler carburetor as standard equipment. This is the product of Wheeler & Schebler, Indianapolis, Ind., and the



Plan View of Merz Cyclecar Chassis and Front, Rear and Side Views of Completed Car, Fitted with Passenger and Delivery Bodies.

operated at an actual expense of one cent a mile for gasoline, oil and tires.

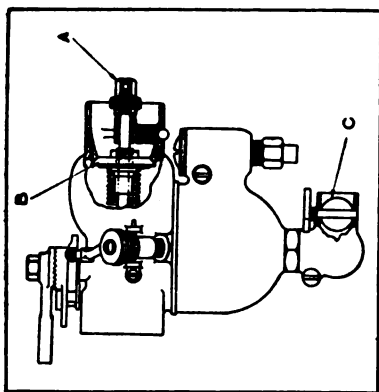
The motor is a De Luxe two-cylinder, air-cooled V type, with bore of 3.5 inches and stroke of 3.67, and the maker's rating is 9-12 horsepower. Drive is by shaft to the friction transmission, which provides four forward speeds and reverse, thence by short V belt to the rear wheels. The friction clutch is supported by a cross member about amidships. The friction wheel has a fiber surface contacting with a steel driving disc. The brake employed is a contracting band on the countershaft, and both clutch and brake are operated by pedal.

A distinctive feature of the design is the use of a single headlight in the centre of the front, and almost flush with it. This front is a wire

specially designed model H Schebler cyclecar carburetor is shown in an accompanying illustration.

It will be noted that it is in effect a modification of the well known model H, designed for motorcycle use. The chief difference is to be found in the provision of choking devices in both the primary and secondary air openings to provide for easier starting. A butterfly valve C, to which a wire is attached, provides for shutting off the primary air supply, and in order to prevent the increased suction thus produced from opening the high speed air valve B a wire is also attached to the spindle A, which when pulled outward locks air valve B by compressing a spring behind it. The result of this double choking is to insure a rich fuel mixture being drawn into





The Model H Schebler Cyclecar Carburetor.

without undue throttling of the charge by heavy spring pressure on the auxiliary air valve.

### CHANGES IN WOODS MOBILETTE.

#### Chicago Manufacturer Announces a Second Model Presenting New Features.

The Woods Mobilette Company, Chicago, Ill., which announced a friction driven cyclecar some months ago, is now making public the constructional details of the Woods Mobilette, model No. 2, in which several changes are noted. The original machine was equipped with a two-cylinder motor, but this later was replaced by a four-cylinder unit, and in this respect the model No. 2 does not differ.

The principle change is in the transmission, which is now incorporated with the rear axle, forming a single unit. This axle is of the full floating type, with full bevel gear differential. Roller and ball bearings are used in the axle, and the transmission shafts are mounted on three sets of ball bearings. The transmission is of the planetary type, affording two forward speeds and reverse. The shifting lever is located in the centre of the car, and the selective type of quadrant is used. The clutch is a multiple disc, located in the transmission case. The brakes are of the internal expanding type and operate in eight-inch drums on the rear wheels.

The front axle is tubular. The drive shaft runs in a straight line from the rear axle to the crankshaft, where it is coupled with a universal joint.

the cylinders.

Model M follows the principles of the latest Schebler carburetors for full sized cars in having an adjustable cam to raise the needle valve as the throttle opens, thus providing more gasoline at high speed

Semi-elliptic springs are used in front and cantilever in the rear. The wire wheels are of special Woods design, and are shod with 28 by 2.5-inch tires. The wheelbase is the same as the older car, 98 inches, and the tread 30. The seats are arranged in tandem.

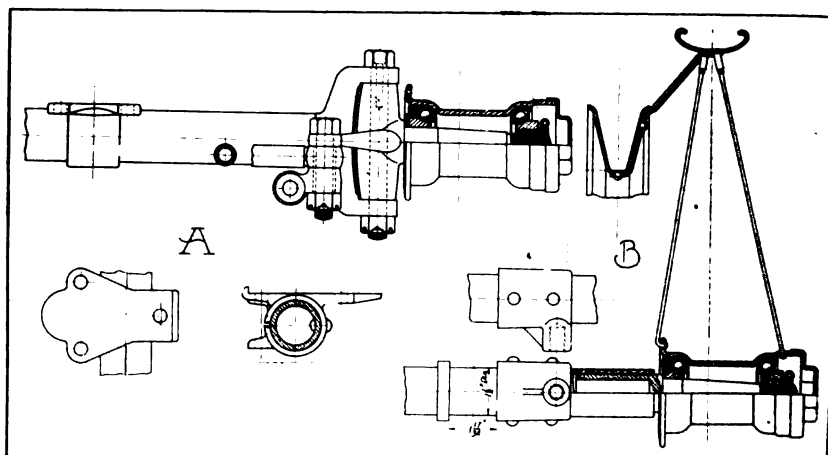
### CRICKET IS A NOVEL DESIGN.

#### Has No Rear Axle, Drives One Wheel and Carries Motor at the Side.

A cyclecar which presents a decidedly distinctive appearance is the Cricket, to be built in Detroit by the Cricket Cyclecar Company. Its most striking feature is the location of the power plant at the side, while others include the use of a novel form of three point suspension, without a rear axle, and drive from one wheel only.

The original model is said to have been designed and built by Anthony New, a noted English automobile engineer, and to have undergone a thorough test abroad, before it was purchased, together with all patents and drawings, by a well known Detroit manufacturer, who interested a number of local capitalists in a company which will shortly place the first series in the market. It is stated that the company expects to deliver sample cars early this year.

The car has two independent side frames of tubular construction, connected by light, flexible cross members, so that the whole structure is expected to conform to road inequalities without undue strain on any part, the body moving freely through what amounts to three point suspension on the side frame. Spiral springs are used in front, this construction being similar to that of the Morgan, the English cyclecar which won the Grand Prix race in France in 1913.



Bicar Cyclecar Axles: A, Front Axle Construction; B, Rear Member.



There is one semi-elliptic spring at the rear.

The motor is a two-cylinder, air-cooled V unit, which, with the disc clutch and sliding gear transmission, is mounted in one of the side frames beside the driver, at the right. Drive is by chain from the engine to the transmission, which has two speeds forward and reverse, and by V belt to the right rear wheel. There is no rear axle, and it is stated that during the severe road trials to which the car has been subjected, the drive from a single wheel has proven eminently satisfactory, and that, owing to this feature and the independence of the rear wheels, there is no skidding, no matter what the condition of road surface.

The wheelbase is 82 inches and the tread 46. Wire wheels of the motorcycle type are used, the tires being 28 by 2.5 inches in front and 29 by 2.75 inches in the rear. The low hung body seats two passengers side by side, and provides storage space under the hood. Direct steering by means of a 15-inch hand wheel is stated to be extremely satisfactory. The weight is about 500 pounds, and it is maintained that the fuel consumption is about 40 miles to the gallon.

Tracy Lyon, formerly director of production for the General Motors Company, is manager and engineer of the company, and O. C. Hutchinson, formerly general manager of the Olds Motor Works, and before that with the Rainier company, is in charge of sales and advertising.

### LONG TRIP FOR FALCON.

#### Making Overland Journey from Cleveland to New Factory in Staunton, Va.

Bryce E. Blackley, assistant production manager for the Falcon company, maker of the Falcon cyclecar, accompanied by George F. Cox of Cleveland, left that city in one of these machines Dec. 29, en route for the new factory of the company in Staunton, Va.

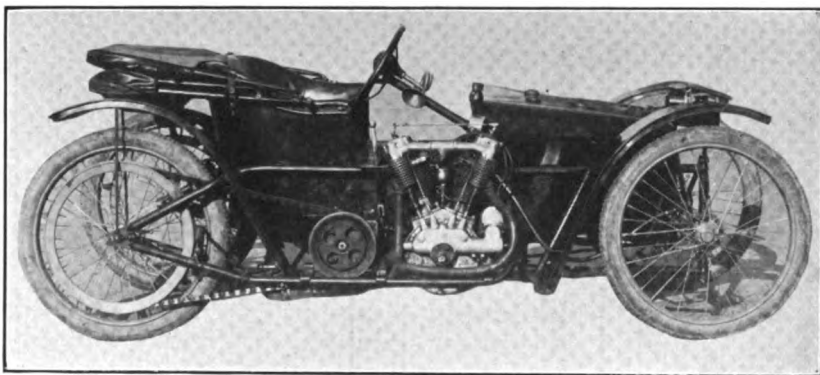
From Alliance, O., under date of Jan. 2, Blackley wired that mud, snow drifts and all kinds of bad roads had been encountered, but the little machine had been able to pass two five-ton trucks and a seven-passenger, six-cylinder touring car, which had been delayed as the result of recent storms.

### MAKING BICAR AXLES.

#### Engineering Equipment Company of Indianapolis Enters New Field.

Believing that there is to be an important demand for cyclecar components, the Engineering Equipment Company, State Life building, Indianapolis, Ind., has brought out designs for front and rear cyclecar axles, the details of which are presented in an accompanying illustration. The company states that these axles are now being shipped, under the trade name of Bicar.

The forward axle is of the automobile type, with forged ends and knuckles. The standard tread is 36 inches, but it is maintained that owing to the tubular construction any width of tread can be furnished and the spring pads can be set any distance apart. These pads are designed to



Side View of Cricket Cyclecar, with Motor at the Side.

take quarter-elliptic springs. The design can be modified so that a dropped axle can be supplied to builders who desire this feature.

The rear axle is a straight tubular construction, with stubs either brazed in or electrically welded to the tube. Provision is made for the use of loop ended quarter-elliptic springs, which the company holds make for a very simple mounting. The arrangement of the radius rods is such as to give a wide range of belt adjustment.

The belt pulleys are extra deep, a feature which is expected to permit of running the belts loose without possibility of their jumping out. They are fastened to the rims by heavy pressed steel lugs. Rims can be supplied for 28 by three-inch or 28 by 2.75-inch tires, as desired.

This company also produces springs, and while it recommends the quarter-elliptic type for light car work, it will furnish any type to specifications of purchaser.







cast separately and having a bore of 4.75 inches and stroke of five. The horsepower rating according to the S. A. E. formula is 36.1. The

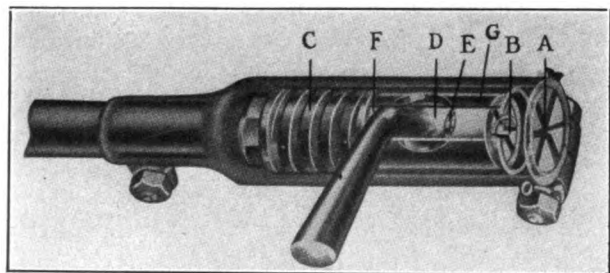


Fig. 2—Components Utilized in Adjusting Fore and Aft Rod Connection of Knox Cars.

piston displacement is 354.42 inches. The valves are located on the left.

Carburetion is by a model L water jacketed Schebler and the fuel feed is by gravity. The ignition system is dual, magneto and battery. Lubrication is by splash, a pump circulating the oil. Cooling is by water, the pump being driven from the end of the camshaft. The radiator is of the cellular type and the usual fan is included.

The clutch is a cone, leather faced and the gearset of the selective type, providing three forward speeds and a reverse. It is operated by a lever at the right of the driver, who is located at the right. The brakes are internal expanding and external contracting. The wheelbase is 123 inches and tires 36 by four. The front springs are semi-elliptic and the rear semi-elliptic platform. The chassis weight is 2600 pounds. The car is not being manufactured now. Parts may be obtained, however, at Orange, Mass.

#### Mitchell Six Ignition.

(1691)—What is the firing order of the 1912 six-cylinder Mitchell? Is the magneto a high-tension and how is it wired?  
La Crosse, Wis., Jan. 1.

The cylinders of the 1912 Mitchell fire in the following order: 1, 5, 3, 6, 2, 4.

The magneto employed as standard equipment is a Splitdorf, made by the Splitdorf Electrical Company, Newark, N. J., which concern will forward a booklet on request, showing its construction, operation and method of installing, etc. It is termed a high-tension magneto, in that its armature has but a single winding and a current of low potential is obtained.

The primary current is transformed into a high-tension

sion by the use of a coil having a low and high-tension winding, constructed on practically the same principle as the induction coil utilized with battery system of ignition. The transformer coil builds up the low-tension current to a sufficient value to overcome the resistance of air at the electrodes of the spark plug.

The wiring plan is shown at Fig. 3, and the primary wires are denoted by thin lines and the secondary by heavy. The ignition system is a dual one, in that either the cells or magneto may be employed, but the batteries are generally used for starting purposes only. It will be noted that the primary current is collected from the magneto, led to the coil, thence to the terminal in the centre of the distributor. It will also be seen that neither side of the batteries is grounded, both connections being made at the coil.

#### Back Pressure.

(1692)—Is it possible for the muffler to become so clogged with carbon, etc., as to prevent the starting of the car?  
I. W. K.

Boston, Jan. 3.

Such a condition might be possible, but a case has never come to the notice of the writer.

#### Periphery of Flywheel.

(1693)—I note mention made of the periphery of the flywheel in your magazine. Is it the surface of the wheel?  
NEW OWNER.

Chicago, Ill., Dec. 29.

The term as utilized refers to the surface or circumference of the flywheel.

Practically every dealer in Hartford, Conn., will be represented in the show to be held in the Casino, Feb. 21-28, according to present indications. The event is to be under the auspices of the Hartford Automobile Dealers' Association.

The Waite Auto Supply Company, Providence, R. I., is mailing to the trade an attractive loose leaf desk calendar for the year 1914.

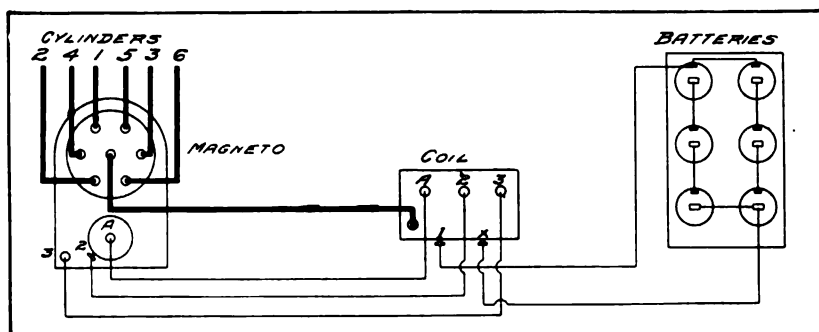


Fig. 3—Wiring Plan of Six-Cylinder Mitchell Car, Which Employs a Splitdorf Magneto.





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## BUSINESS CONDITIONS GOOD.

It probably will not be denied that the Chamber of Commerce of the United States of America, which was organized early in the past year, being in effect an amalgamation of the various chambers of commerce and boards of trade throughout the country and therefore in direct touch with the conditions in the various sections, is a thoroughly impartial judge as to the effect of those conditions upon business generally. Elsewhere in this issue is presented a digest of the report issued by this body at the close of the year, and no better comment could be made concerning the outlook for 1914.

The analysis is most complete in every particular, and where no reference is made to a specific industry it may be taken for granted that

the conditions are good. The map which accompanies the report is fairly representative of business conditions at any time, insofar as its general characteristics are concerned. The situation is most encouraging, and bears out the optimistic tendencies revealed by the recent investigations conducted by The Automobile Journal.

## TRAVELLING MEN'S OPINIONS.

It is somewhat surprising to note how little the magnitude of the automobile industry is appreciated by the general public. It might be assumed that as a body, travelling men were well informed as to industrial enterprises. The following quotation from The Manufacturing Jeweller is an example of the regard with which their opinion is held:

Travelling men say they cannot account for the present dullness. Some of the jewelry drummers have an idea that the purchase of so many automobiles by thousands of people throughout the country, and the necessary expense incurred in running the same, may have some effect.

A travelling man, who was engaging the attention of passengers on a train out of New York recently, with somewhat similar opinions and the further observation that within a year there would be but half a dozen automobile manufacturers in America, was asked how many he thought there were today. "Offhand, about 30", was his reply.

He was surprised to learn there were more than 200; that they had produced 450,000 cars during the past year, and had shipped nearly \$28,000,000 worth of these machines abroad. The opinion of travelling men regarding the stability of the automobile industry evidently needs decided revision.

## UNIFORM MOTORING LAWS.

At last the commissioners appointed to represent the various states in a conference for the purpose of formulating uniform motoring laws have met and organized for business. It is indeed gratifying to note the chairman's statement that those engaged in the preparation of a model statute are to be governed very largely in their deliberations by the counsel of Common Sense. This "therapeutic friend" has been overlooked too often by those who have framed motoring regulations in the past.



## PLANS COMPLETE FOR CHICAGO SHOW.

**Conservatory Settings for Coliseum and First Regiment Armory---Provisions Made for Extra Display Space---Cars and Accessories Not Seen at New York.**

**F**OR the 14th annual national automobile show in Chicago, Jan. 24-31, the Coliseum and First Regiment Armory will present conservatory settings. That is to say, the splendor with which past displays in that city have been connected in the minds of visitors will be somewhat modified. Considerable additional floor space will be afforded by the extension of the gallery in the Coliseum proper. Of course, this presages a larger show than ever before, although this is not indicated by the grand total of motor car exhibitors.

A canvass of the manufacturers in 1913 reveals the opinion that the Chicago display retains rather more of the old time national show atmosphere than is true respecting the New York exhibition. By this is meant that many dealers in the Middle West and Southwest still make it a practise to visit the Chicago show for the purpose of securing new contracts.

No automobile show ever has approached the record of the annual Boston event in number of actual sales. New York and Chicago are the only cities in the country where the annual display is dignified by the term national. A strict interpretation of this term would seem to indicate that the exhibitions in these two cities were held primarily for the purpose of interesting dealers. It may be contended that ornate decorations will have little effect upon the dealer who is interested in representing a car which will meet the demand which exists in his territory.

There are those in the industry who see in the announcement regarding a modification in the matter of decorative treatment, a strong disposition on the part of the management to make the 1914 Chicago show a general meeting place for manufacturer and dealer, although, of course, there will be no lack of opportunity to do business directly with the prospective owner. Manufacturers are ready to concede that the big retail show of the year is that held in Boston. In the Middle West, and, in fact, throughout the entire country, the so-called minor shows of other years are fast assuming major proportions in many instances. The Chicago show of 1913 was most successful in reaching the dealer, and it is anticipated that the same will be true this year.

The event will be under the auspices of the

Automobile Chamber of Commerce, as was the New York display, which just closed. The management is directly in charge of Samuel A. Miles, who has been manager of all of the Chicago displays. His intimate knowledge of the industry and its growth in the Middle West, as well as the people in that section who may be interested in an event of this character, places him in an enviable position in this regard.

Mr. Miles acquired his first motor car in March, 1900, and about the same time he became an enthusiastic member of the Chicago Automobile Club. Shortly after the first show was announced in

New York City, Mr. Miles was convinced that something of this nature would appeal to the residents of the Middle West. He enlisted the co-operation of the Chicago Automobile Club, and that the event was a success is best evidenced by the fact that when the National Association of Automobile Manufacturers was formed he was selected as general manager, a position he has held ever since, for the Automobile Chamber of Commerce is but a continuation of the National Association of Automobile Manufacturers, in amalgamation with the Automobile Board of Trade.



**Samuel A. Miles, General Manager,  
Chicago Automobile Show.**

The statement regarding the decorative treatment this year may be amplified as follows: In the Coliseum, the roof of which is domed or rounded, the conservatory design is to be begun on the ground floor and carried to the ceiling. The wall spaces will be backed by canvas painted to represent glass, and the roof will be concealed



by similar painting, in which a scroll effect will separate the various "panes".

On the ground floor, flowering vines will "take root" and "grow" upward to the ceiling. The main aisles will be marked at either end by tall, slim, poplar trees, imported from Austria, between which will be giant vases overflowing with flowers. Gold pillars, surmounted by a statue of a kneeling automobile girl, will mark the various exhibition spaces.

Practically a repetition of this scheme will be worked out, so far as possible, in the armory. The fact that a larger portion of the latter structure will be devoted to the display of accessories, etc., will necessitate alterations in the gen-

those which have been reported by the management to date. The car exhibits will be disposed as follows:

**Coliseum**—Winton, Locomobile, Paige, Jeffery, Franklin, Packard, K-R-I-T, Buick, Reo, Studebaker, Abbott-Detroit, Chalmers, Maxwell, Peerless, Hupmobile, Stevens-Duryea, Cadillac, Pierce-Arrow, Overland, Cole, Hudson, Regal, Oakland, Velle, Cartercar, Premier, Jackson, Stearns-Knight, White, Lozier, Kissel-Kar, Haynes, Marmon, Willis-Knight, National, Moon, Mitchell, Metz, Case, Imperial, Auburn, Marion, Oldsmobile, Apperson, King, Flat—all gasoline.

**First Regiment Armory**—Mercer, Henderson, Pathfinder, Moline-Knight, Norwalk, Stutz, Speedwell, Chandler, Great Western, Herreshoff, Austin, Lyons-Knight, Allen, Keeton, Davis, Lambert, McFarlan, Crow, Partin-Palmer, Palmer-Singer-Magic—gasoline. Chicago, Century, Broc, Borland, Woods, Argo, Standard, Waverley, Baker, Detroit—electric.

**Coliseum Basement**—Flyer, Vulcan, Lexington, Ohio.



Exterior of the Coliseum in Chicago, Where 14th Annual National Automobile Show Will Be Held Jan. 24-31.

eral plan. The entire effect, however, will be to provide nothing which shall detract from the exhibits themselves.

According to the latest information respecting the number of cars to be displayed, there will be 71 makes of gasoline machines, 10 of electrics and four of cyclecars. None but pleasure cars will be shown. Of the gasoline cars, the Norwalk, Austin, Lambert, McFarlan, Crow, Elkhart, Flyer, Ohio and Lexington were not seen at New York. The Chicago, Century, Broc, Borland, Woods, Argo and Standard electrics also were not exhibited at the Grand Central Palace. It is expected that additional cyclecar makers will secure space before the doors are opened to the public, but the list given includes only

McIntyre—gasoline cars. Cornellian, McCord, Lomax, Imp—cyclecars.

It will be noted that the practise, which was inaugurated last year, with respect to placing the electric machines by themselves in the centre of the First Regiment Armory, will be continued this year. The interest in such cars in the Middle West is such as to make this plan most desirable in every way. This also will have its bearing upon the decorative treatment of that building.

The list of accessory exhibitors indicates there will be no less than 165 makers of parts, supplies and fittings represented. These will be located in the Coliseum gallery, Coliseum basement, Coliseum annex and First Regiment Arm-



ory gallery. The extension of the gallery floor in the Coliseum has been with a view to placing the aisle along the railing outside the exhibition spaces, a feature which will be appreciated by visitors, since there will be no necessity for avoiding the overhead girders, as in the past.

Among the accessory exhibitors, who did not display in New York, are the following:

Fort Dearborn Mfg. Co., Chicago.  
Pierce Speed Controller Co., Anderson, Ind.  
Electric Products Co., Cleveland, O.  
Modern Auto Appliance Co., Auburn, N. Y.  
Sulzberger & Sons Co., Chicago.  
Auto Parts Co., Chicago.  
Cotta Gear Co., Rockford, Ill.  
L. P. Halladay Co., Streator, Ill.

Wm. E. Pratt Mfg. Co., Chicago.  
Morrison-Ricker Mfg. Co., Grinnell, Ia.  
Tuthill Spring Co., Chicago.  
Hess Spring & Axle Co., Carthage, O.  
Gould Storage Battery Co., New York City.  
Rutenber Motor Co., Marion, Ind.  
Baldwin Chain & Mfg. Co., Worcester, Mass.  
Continental Motor Mfg. Co., Detroit.  
Diamond Chain & Mfg. Co., Indianapolis, Ind.  
Lovell-McConnell Mfg. Co., Newark, N. J.  
Auto Parts Mfg. Co., Muncie, Ind.  
Warner Mfg. Co., Toledo, O.  
McCord Mfg. Co., Detroit.  
Imperial Brass Mfg. Co., Chicago.  
Whitney Mfg. Co., Hartford, Conn.  
Automobile Supply Mfg. Co., Brooklyn, N. Y.  
Waukesha Motor Co., Waukesha, Wis.  
Dunlop Wire Wheel Corp., New York City.  
S. Breakstone, Chicago.  
U. S. Ball Bearing Mfg. Co., Oak Park, Ill.  
Taylor Instrument Co., New York City.

## TEST ECONOMIN, A BRITISH MOTOR FUEL.

**I**N A recent issue announcement was made of a new motor fuel, which was to be marketed in Great Britain under the name of Economin. At that time little information was available as to the nature of the new product, although it was stated that it had the indorsement of a well known British automobile manufacturer. Prof. Robert W. A. Brewer, an engineer of prominence in England, states that he has had opportunity to make several tests of the new fuel in comparison with gasoline and benzol, and concerning the fuel he has the following to say:

Economin itself is one of those fuels which are physically and chemically treated in order to render them volatile, and to reduce the carbon constituent. As distinct from the Lamplough process, which is a heat treatment, and the Shonrey process, which is a chemical one, the method of production in Economin is a combined process of treating kerosene, shale oil, naphtha and other similar hydrocarbons in the following way: Eighty per cent. of the raw material is mixed with 20 per cent. of a solution of resin and certain other bodies in benzol and benzine; the mixture, after standing, is distilled up to a temperature of about 240 degrees Centigrade. About 70 to 80 per cent. of this volume of the original mixture comes over as Economin spirit, which has a water white appearance and a viscosity somewhere between gasoline and kerosene. The specific gravity of the fuel was 0.767 at 58 degrees Fahrenheit.

Prof. Brewer recently conducted 36 tests with this and other fuels during a single week, the weather being such as to give a very good indication of the behavior of the several fuels under the majority of conditions prevailing in England. Two carburetors of entirely different types were used, one with a fixed and definite jet orifice and the other with a variable one, the dimensions of which could be changed, when the motor was running, by means of a control wire. Concerning these tests he says:

One of the most interesting facts which was brought out was that, while a variation in the size of the jet from 1.25 mm to 1.15 mm improved the fuel consumption (when everything was hot) from 18.5 miles a gallon to 24.5, yet with Economin there was less than .75 miles a

gallon difference when using jets varying from 1.15 mm to 1.30. These were in tests at 30 miles an hour. The effect, however, on the motor was marked at this speed, as insufficient power was produced with the smallest jet running on Economin to drive the car up the slope of the small banking at Brooklands on top speed.

This small jet (1.15 mm), although it gave the best gasoline consumption, was too small for practical use with that fuel, as the car speed dropped by 10 miles an hour in the before mentioned locality. We may, therefore, take it that for all around work the correct size of the jet was the one used, of 1.25 mm diameter, and this jet had previously been used to a considerable extent by the writer in other tests. This jet was certainly not too large, as on the coldest days, when the temperature in the morning was from 42 to 45 degrees, some slight difficulty was experienced in starting with either gasoline or Economin, but this difficulty disappeared when a jet of 1.30 mm was fitted.

An extract from the table of results shows briefly that, with the car in question, having a weight of 30 hundredweight, a wide windshield and an engine of the T head type, 100 mm bore by 105 mm stroke (3.9 by 4.13 inches), results in the following order were obtained:

At 20 miles an hour Economin gave 27 miles a gallon as against an average of 26.6 with gasoline with one carburetor.

At 30 miles an hour, the average results with both fuels were identical—25.9 miles a gallon.

At 40 miles an hour, Economin gave 16.5 miles a gallon with one carburetor and 20.8 with the other, as against 17 on gasoline with the first mentioned carburetor.

With every fuel tried and with each carburetor the maximum speed attained was about 55 miles an hour, but the rate of acceleration varied slightly. For example, the acceleration to 30 miles an hour occupied 28 seconds in each case, except with one carburetor on gasoline, when the time noted was 21 seconds, and the speed at the end of half a mile was practically the same in each case—44 miles an hour.

Briefly, the fuel Economin is comparable with gasoline in all ordinary circumstances, but does not appear to be as susceptible to faulty adjustment of jet size on the large side.

A total of \$197,700 is offered for prizes in racing events throughout the country during 1914, divided as follows: Indianapolis 500-mile race, \$50,000; Seattle speedway, \$30,000; Sioux City, \$25,000; Vanderbilt and Grand Prize, \$16,000; Los Angeles-Sacramento, \$14,300; Corona, \$11,000; Tacoma, \$10,500; Santa Monica, \$10,000; Elgin, \$10,000; Los Angeles-Phoenix, \$9,500; El Paso-Phoenix, \$6,400; Galveston beach, \$5,000.

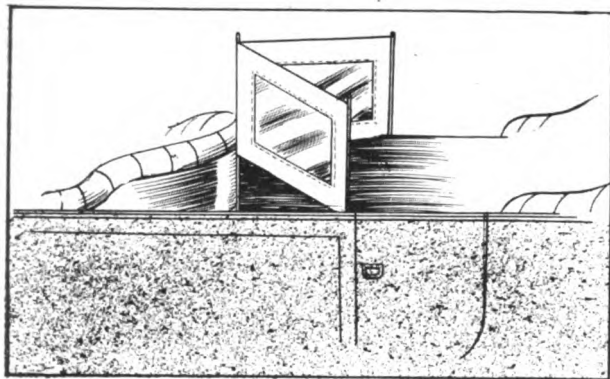


## MECHANICAL NOTES FOR OWNERS.

### Converting Gravity Fuel Feed to a Pressure System—Care of Tires and Rims in Cold Weather—Home Made Tonneau Windshield—Concealed Radiator Cover.

**W**INDSHIELDS are appreciated in cold weather, but with the top down the occupants of the tonneau seats experience considerable draught, largely due to the air currents set up by the windshield. The following suggestion is made by a reader for providing protection to the passengers in the tonneau, and the contributor writes that the cost of material is slight and that the work may be performed easily. As will be noted by an accompanying drawing, the rear windshield is made V shaped, and the owner states that as far as he can ascertain it has not increased the resistance; that is, has not affected the speed of the car.

I am enclosing a rough sketch of a windshield which I constructed and fitted to my machine, which has a toy tonneau. My friends complained of draughts in the rear seats and not wishing to go to the expense of purchas-



**Home Made Windshield Designed and Fitted by a Reader to Protect Occupants of Rear Seats from Draughts.**

ing a ready made tonneau windshield, I gave the problem considerable thought.

As the rear seats are rounded, I found that I could attach an iron rod, which was made flat at one end and drilled to take a number of wood screws. The upper section of the rod, which was .5-inch round stock, extended above the top of the front seats as shown in the drawing. The rod was screwed to the back of the front seats, although it could have been provided with an angle at the lower end and screwed to the floor of the tonneau, and a clamp used to support the upper end. Similar rods were made for each side of the tonneau. These were fitted on the front side of the hinges so as to permit opening and closing the doors.

The windshield proper was constructed of heavy cotton duck, two layers being employed for each wing. The celluloid I secured from an old top and this was sewed between the two layers. The centre of the shield was fitted over the front seat rod and then sewed to form a loop, which was fitted snugly. Each rear end of the wings was fitted in the same manner. After completing the work I gave the cloth a coat of oil, then painted it to match the finish of the machine.

To use the shield it is a simple matter to slip the loop sections over the rods, and in measuring for the cloth it is important that a snug fit be made so that the wings

will be stretched tight when on the rods. I found that with a loose fit—that is, a slack in the wings—they would vibrate and flap, so refitted them. Of course the car looks odd with the shield removed, as the rods are noticeable, but the shield keeps the draughts off the passengers in the rear seats. In measuring, it is advisable to make the height of the wings such that the lower edge comes inside of the body.

### INSTALLING PRESSURE FEED.

Many owners display considerable ingenuity in improving the operation of their motors and cars, and an instance was noted recently by the writer. The machine was a 1906 model, with which the owner was loath to part because the motor ran perfectly and had good power. Considerable trouble was experienced in starting, however, which was largely due to the fact that the intake pipe was very long and that the valve tappet guides were worn, admitting more or less auxiliary air. Another trouble experienced was that of dirt finding its way from the road into the carburetor, as the power plant was not protected by a pan or undershield. To construct and fit a pan would have involved considerable expense, since the carburetor was several inches below the frame. The feed was by gravity, the fuel tank being of the conventional square type and located under the seat.

After studying conditions the owner decided to replace the gravity feed with pressure and to carry the carburetor higher and in proximity to the cylinders, where their heat could be employed to raise the temperature of the fuel. The intake manifold was provided with a long elbow to which the carburetor was connected. This was discarded and the carburetor fitted to the intake pipe proper.

The fuel tank was converted into a pressure member by soldering the opening in the filler cap and carefully fitting washers to make it air tight. Pressure was supplied from the exhaust manifold, which was tapped to take a pipe provided with the usual check valve connections, and the conventional pressure gauge, hand pump, etc., were incorporated.

With the carburetor placed higher and above the frame, it was a simple matter to make and fit shields on either side of the motor and between it and the radiator. The engine was suspended at four points, the extension or arms of the upper



crankcase being bolted to the frame. By fitting a strip of heavy sheet metal and drilling holes to correspond with the crankcase bolts, one side of the pan was secured, while the other was fastened to the frame by stove bolts. A similar arrangement was employed between the front cylinder and the radiator.

The owner states that the cost of the material was not excessive and that better results are obtained from the motor, as the carburetor does not become filled with road dust and mud as formerly. It is also stated that starting is much easier and more mileage is obtained from a gallon of fuel.

### CARE OF RIMS.

Although the importance of caring for the tire rims has been pointed out in these columns, reference to the subject is especially timely at this season of the year, when the rims are exposed to moisture. The removal of a shoe is not a pleasant task in warm weather and is more difficult in the winter, as not only is the casing less pliable, but frequently the hands are too cold to operate the rim mechanism, and anything that will make for easy removal will be appreciated by the motorist.

In addition to facilitating the work of changing a tire, proper care of the rims makes for economy. When rims are neglected they become coated with rust, causing deterioration of the rubber, and sometimes the latter becomes so frozen to the rim that force is necessary to remove the casing. With the protective material removed from the casing moisture finds its way to the fabric, with the inevitable result—a blow-out.

Remove the casings from the rims at least once a month and clean the latter. This will permit of inspecting the shoes and the vulcanizing of any cuts that may exist. It will also afford an opportunity for backing up a weak place with fabric, preventing a blow-out, and obtaining additional mileage.

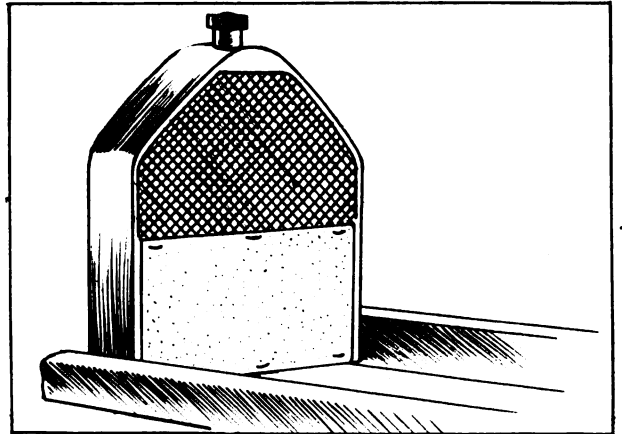
After cleaning the rims and removing any high spots, prepare a mixture of powdered graphite and oil, utilizing as much of the former as is necessary to make a thick paste. Smear the rims and their locking mechanism liberally with the mixture, rubbing it well into the pores of the metal. Next take a cloth and remove the superfluous material. The result will be a high polish and a surface that will resist the action of water. It is surprising how easily the tire can be removed after this treatment.

### COVERING THE RADIATOR.

The modern motor is equipped with a cooling system which makes for efficiency in warm weather, but when low temperatures prevail the fluid is apt to be too cool to obtain good results from the motor. The most common method is to fit a radiator shield at the front of the cooler, but a variation of the practise was noted recently by the writer.

The car was a 1913 model and its owner found that on cold days the water did not get warm enough, and that on mild days it became heated, owing to the large per cent. of alcohol used to prevent freezing. Instead of placing the shield at the front of the radiator, it was fitted at the rear, as shown in an accompanying illustration.

It was explained that with the cover in front, on mild days the water became too hot, as the



A Radiator Cover, the Location of Which Differs from Conventional Practise, in That It Is Located at the Rear of the Cooler.

motor was often run for long intervals, the machine being utilized in the owner's business. He claims that with the cover in back a proper working temperature is secured, as the shield restricts the air passing through the cooler to the cylinders. The proper height of the shield was determined by experimentation. The method of fastening is shown, it consisting of wires run between the fins and twisted at the front. The method has one advantage, in that the cover is concealed.

At the annual meeting of the Waterbury Automobile Club, Waterbury, Conn., the following officers were elected: President, Walter W. Holmes; vice president, Lewis A. Platt; secretary, William E. Hunt; treasurer, H. S. Seeley; board of governors, Robert A. Coe, Dr. A. A. Crane and F. W. Tate.



## IMPROVED ROADS AND MOTORING LAWS.

### Uniform Statute Commissioners Organized for Business—Nantucket Is Experiencing Novel Automobile War—Traffic Regulations in Maryland.

COMMISSIONERS representing the states of Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Delaware and Maryland, met in New York City last month for the purpose of securing uniform legislation in all states for the regulation of automobiles. S. W. Taylor of New York, chairman of the Motor Vehicle Legislation Commission's Conference, as the body evidently is to be known officially, reports that work is under way looking toward the drafting of a model bill, in which an effort will be made to cut out a mass of superfluous specifics and permit "our old therapeutic friend, Common Sense, to write into the law one of his effective prescriptions".

Before the next meeting of the conference, further efforts will have been made to have the states of Maine, New Hampshire, Vermont and Rhode Island appoint commissioners. It would seem that there ought not to be objection if other commonwealths see fit to join the conference, since the main object of the body is to prepare a bill which can be urged upon the legislatures of all states, to the end that uniform motoring regulations may be in force throughout the entire country.

#### NANTUCKET'S AUTOMOBILE WAR.

##### Mail Carrier Is Still Using His Motor Car Under Serious Difficulties.

The island of Nantucket has been successful in excluding automobiles for a number of years, but just at present it is experiencing some difficulty in forbidding the use of a machine which Clinton S. Folger purchased some weeks since for use in carrying mail and passengers between Nantucket and Siasconset. Folger has been arrested twice and fined in the local court. These cases are now pending on appeal, and the automobile is being operated under its own power on the state highway between the two towns.

As soon as the selectmen of Nantucket heard of the purchase of the machine, they called a special town meeting, at which it was decided to continue the exclusion of all such inventions. This exclusion order was approved by the Massachusetts highway commission in due form.

Then the car appeared, and was driven up in front of the postoffice. The first arrest followed. After appearing in court, pleading not guilty, and appealing his case, Folger again took up his duties as mail carrier, only to be arrested a second time, even after he had given the chief of police a ride just to show him how the machine worked.

Folger claims he has a perfect right to operate his machine on the state highway, and thus far no attempt has been made to stop him, pending the appeals. He has been warned, however, that he must not operate the car under its own power one inch over the town line. In order to avoid further trouble of this nature he has acquired the services of a horse, which draws the car into and out of town. Once over the town line the horse is unhitched and the remainder of the trip is made by gasoline propulsion.

#### FALL RIVER TAKES ACTION.

##### Board of Aldermen Orders Police to See That Law Is Not Violated.

The board of aldermen in Fall River, Mass., has called the attention of the police department in that city to the fact that chapter 803, acts of 1913, relative to the operation of traction engines, etc., is being violated and has instructed the board of police to take such steps as may be necessary to stop such violation. The chapter in question reads as follows:

Section 1—No traction engine, trailer, motor or other vehicle shall be operated upon or over a highway or bridge in any city or town in this commonwealth, nor shall any object be moved over or upon any such highway or bridge upon wheels, rollers or otherwise, in excess of a total weight of 14 tons, including vehicle, object or contrivance and load, without first obtaining the permit mentioned in section 3 of this act from the authorities therein mentioned; nor shall any vehicle be operated or contrivance moved upon or over said highways or bridges which has any flange, ribs, clamps, or other object attached to its wheels or made a part thereof, which will injure, cut into, or destroy the surface of the highway or bridge for any considerable depth; and in the towns of the commonwealth outside of the metropolitan parks or sewage districts no such engine, vehicle, object or contrivance for moving heavy loads shall be operated or moved upon or over any such highway or bridge the weight of which resting upon the surface of said highway or bridge exceeds 800 pounds upon any inch in width of the tire, roller, wheel or other object, without first obtaining said permit, unless such highway is paved with brick, block, sheet asphalt, concrete pavement or surface. The owner, driver, operator or mover of such



engine, vehicle, object or contrivance over said highway or bridge, shall, unless relieved from liability in said permit, be responsible for all damages which said highway or bridge may sustain as a result of said action on his part, and the amount thereof may be recovered in an action of tort by the authority or authorities in charge of the maintenance or care of said highway or bridge, or by the authorities of the town, Massachusetts highway commission or the county commissioners, which have charge of the highway or bridge which is injured.

Section 2—No steam traction engine, with or without trailers, and no motor truck, carrying a weight in excess of four tons, including the vehicle, shall be operated upon any highway or bridge in this commonwealth at a speed greater than 15 miles an hour; and no such vehicle carrying a weight in excess of six tons, including the vehicle, shall be operated on such highway or bridge at a speed greater than six miles an hour when such vehicle is equipped with iron or steel tires, nor greater than 12 miles an hour, when the vehicle is equipped with tires of hard rubber or other similar substance.

Section 3—The Massachusetts highway commission, county commissioners, superintendents of streets, selectmen or road authorities having charge of the repair and maintenance of any highway or bridge in any of the towns of the commonwealth are hereby authorized, upon proper application in writing, to grant permits for the moving of heavy vehicles, loads, objects or structures, in excess of a total weight of 14 tons, over said highways or bridges, and for operating or moving over any highway or bridge in any town in the commonwealth any engine, vehicle, object, or contrivance, the weight of which resting upon the surface of said highway or bridge exceeds 800 pounds upon any inch in width of tire, roller, wheel, or other object; which permits when duly granted shall authorize such movement. Said permits may be general or may limit the time and the particular roads and bridges which may be used, and may contain any special conditions or provisions which in the opinion of the authorities granting the same are necessary for the protection of said highway or bridges from injury. The authorities that have charge of any such bridge are hereby authorized to make regulations limiting the speed of any of the vehicles mentioned in this act passing over said bridge to a speed not to exceed six miles an hour, providing that notice is conspicuously posted at each end of the bridge affected by such regulation and load capacity of the bridge is stated therein.

Section 4—Any person violating the provisions of this act or regulations or permits granted under authority thereof shall be liable to a fine of not more than \$100 for each and every offense, and said fines shall be paid into the treasury of the commonwealth for use on state highways, or bridges, when state highways or bridges are injured, and into the treasury of the city, town or county when any highway or bridge is injured which is under the care of said city, town or county, for use on the highways of said city, town or county, in addition to any other moneys that may be available for that purpose.

## TWO NEW BILLS.

### Automobile Legal Association Will Ask Action by Massachusetts Legislature.

The Automobile Legal Association has given public notice that it intends to present two bills before the Massachusetts legislature for enactment at the forthcoming session. The first seeks a change in the punishment for operating recklessly or while under the influence of intoxicating liquors, from a fine or imprisonment to imprisonment only.

The second would compel drivers of horse drawn vehicles to carry lights after dark on any public highway. The present law in Massachusetts requires lights on such vehicles only

where street lamps are more than 500 feet apart, which is held to be a discrimination against the residents of rural communities.

## MARYLAND'S TRAFFIC STAND.

### Motor Truck Owners Are Assured of Fair Treatment in That Commonwealth.

Motor truck manufacturers, owners and users will be interested in the following letter received by the Automobile Chamber of Commerce from H. G. Shirley, chief engineer of the Maryland state roads commission:

We have under construction at present about 60 miles of concrete road. I believe that the concrete road is the coming county road to stand the heavy traffic of automobile trucks. We have no desire in this state to impede economical advancement of hauling with larger equipment than has heretofore been used, but the protection of life is also in our hands, and we must look out for the present structures, which are in such condition that it would be quite a waste of money to destroy them and build new ones, which would be capable of carrying the larger loads.

The bridges which we are erecting today will carry almost any load that can be hauled over a highway, as we design for a weight of 24 tons with a factor of safety of three, which would carry theoretically a 72-ton load. This, in my judgment, will be sufficiently strong. We also have many bridges which were designed for a six-ton load, which are now carrying 12, and they have been standing quite a number of years.

It is quite a difficult matter to decide just where to draw the line, but I think you will find that the officials of Maryland will always try to be reasonable, and try to draw the line where it will be fair to all concerned.

This letter has an important bearing upon the report that Maryland proposes to enact legislation this winter limiting the weight and speed of motor trucks. Governor Goldsborough has appointed a traffic commission to investigate motor trucking and other traffic conditions and to co-operate with the state roads commission in drafting a law that will be fair to all concerned. The Automobile Chamber of Commerce has called the attention of these commissions to the danger of restricting the development of economical hauling, if the limitation of weight is placed too low, and has pointed out that such restrictions may be taken advantage of by county and township road authorities to postpone the rebuilding of old, weak bridges and poor roads.

The annual show of the Washington Automobile Dealers' Association will be held in Convention hall, Washington, D. C., during the week of Jan. 19-24. The number of exhibitors who have taken space is such as to indicate that it will be the largest event of this character ever held in that city. The arrangements are in charge of a committee, of which T. Oliver Probey is chairman.



## NEW LINE OF REMY ELECTRIC MOTOR STARTERS.

**T**HE Remy Electric Company, Anderson, Ind., has announced its complete line, embracing starting motors, generators, combined motors and generators, combined generators with ignition, magnetos and ignition distributors. The company calls special attention to O. F. Conklin, who has been at the head of its engineering department for over 18 months, and who was secured for the sole purpose of adapting motors and generators to car requirements.

It is further pointed out that he is recognized as an eminent authority on lighting and motor starting systems, since he has been a designer and producer of direct current generators and motors for the past 27 years. Four years ago he gave his undivided attention to the adaption of his experience to electric motor car lighting

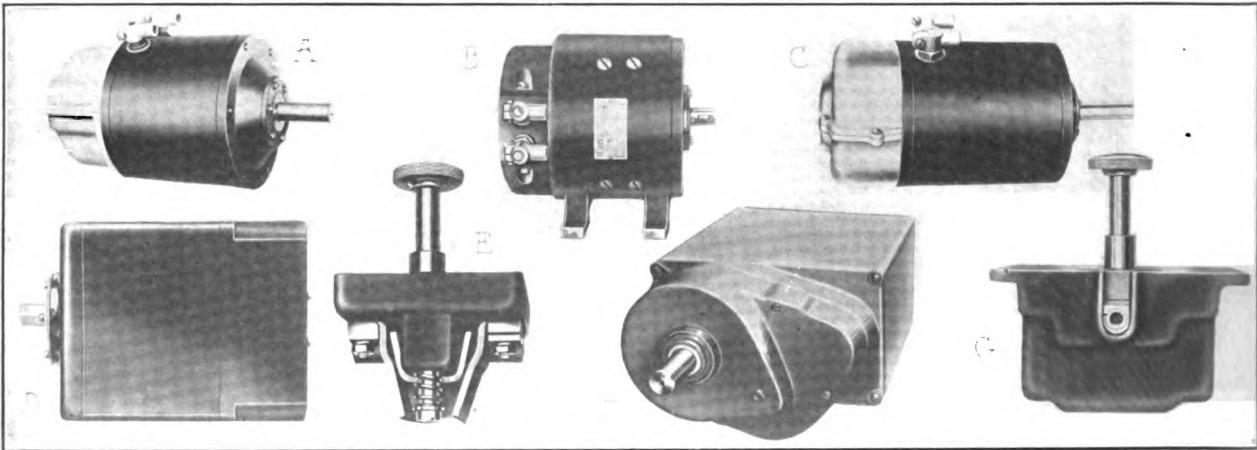
will be economical on account of the assortment of motors.

All armatures are standard drum wound, and rotate on high grade heavy duty ball bearings. Both the armature windings and commutator are designed with a large factor of safety to withstand heavy overloads. The brushes are special and carefully selected for this requirement. All motors are provided with inspection plates, exposing commutator and brushes for inspection. It is not necessary to explain the construction of the detailed parts, such as the manner of assembling core discs, commutator segments, placing of windings, etc., as their construction is standardized.

### Switch Types.

Either "push" or "pull" type of switches are supplied as occasion demands. From the illustrations it may be seen that both switches are plain and sturdy, with large copper current conducting parts. Model 20 is the push type and is to be mounted either on the motor side of the dash or under the floorboards, with only the push pedal protruding. The cover also forms the method for attaching the switch to the dash or floorboards. The model 22 is the pull type and is fitted with a base so that it may be conveniently placed in connection with the gear linkage.

The combination generator and starting motor is de-



**New Remy Electric Starting Motors: A, B, C and D, Models 5, 6, 4 and 9, Starting Motors; E, Model 20, Push Type Switch with Cover Removed; F, SL Combined Starting Motor and Generator; G, Model 20, Push Type Switch.**

and starting. Mr. Conklin is credited with having redesigned several of the successful systems now in use and also has acted as consulting engineer for other companies. He is well known in the wireless world, having developed considerable apparatus for both United States and Canadian companies. In designing the Remy equipment the fundamental laws of electricity have been strictly adhered to and it is stated that the designs are in no way radical or freakish, embodying principles which have been approved and are standard.

The Remy company builds four sizes of separate starting motors, designated as models 4, 5, 6 and 9. With these four motors several different windings are used, so that each car maker may be supplied with exactly the correct size starting motor his engine demands. All are efficient, six-volt, series wound, compact, ball bearing motors, developing ample power to spin engines at high rates of speed, and it is obvious that the operation

designated as model SL and is built in two sizes, with a number of different windings, as the Remy company states its policy is to carefully analyze the make of engine and then supply an instrument which will give the highest engine speed with the lowest possible current consumption.

The SL models may be termed "two-story" or "twin-cylinder" instruments, as the armature of the motor is superimposed over the generator armature, although the frame or field for both is a steel casting. It will be seen from the illustration that this unit is not composed of a motor and generator bolted together. The Remy company states that the two-armature instruments possess distinct advantages over the one-armature motor-generator, since for the most efficient and successful motor car operation the generator must be shunt wound, while the motor must be series wound and each with its own armature.

Unlike the single-armature motor-generator with its double winding and two-commutator armature, and generally two clutches, necessitating two points of attachment to the engine, the Remy company claims its two-armature instrument is less complicated, has but one over-running clutch and one point of attachment to the engine. On the SL either armature or either field might become disabled without affecting the other.

The output of the model SL generator is practically the same as the separate generator and the same third



brush regulating method is employed. The brushes of both motor and generator may be readily inspected by removing large inspection covers, which are placed in an accessible position.

#### **Employ Over-Running Clutch.**

An over-running clutch of the roller type is provided to disengage the motor armature and reduction gears, which remain idle and inoperative when the engine is once started and running under its own power, and it will be appreciated that the wear of the brushes and commutator of the motor is negligible as compared to the wear encountered on the single armature of the motor-generator, which revolves all the time the engine is running.

The generator armature is the only moving part under running conditions. Reduction gears of the spiral type are fitted to the motor armature and countershaft, to insure durability and quietness of operation. The other gears are of the spur type, and all are of hardened steel, and together with the over-running clutch are enclosed in an oil tight housing, thus affording both protection and lubrication. Provision has been made to prevent entrance of oil into the armatures or fields. An overflow is provided on the gear housing and an oil throwing device is fitted to the generator armature shaft. The gear reduction housing is supplied on either the left or right hand side as the occasion demands, and all terminals on the SL may be arranged to suit the motor car maker's requirements.

Rocking or back firing has no injurious effect on this SL apparatus, since the Remy company states that repeated tests of intentional back firing have thoroughly demonstrated that no injury can result therefrom, due to the excellence of construction, method of securing same and the low gear reduction.

The reverse current relay is placed on the dash and forms part of the simplified wiring plan. Its base is made of Bakelite and all terminals are plainly marked. Provision is made on the relay for two additional circuits, such as horn and inspection lamp, etc. The model SL proper is finished in black enamel and harmonizes in appearance with all different makes of engines.

### **ROCHESTER SHOW PLANS.**

#### **Sixth Annual Display of Dealers' Association in Exposition Park.**

The sixth annual show of the Rochester Automobile Dealers' Association will be held in the Exposition Park buildings, Rochester, N. Y., Jan. 24-31. This plan follows that which proved so successful last year, when three of the structures were placed at the disposal of the motor car and accessory exhibitors.

C. A. Simmons will again be in charge as manager, and he states that the display will be even larger than that of last year. One particular feature in the arrangement of the exhibits during the 1913 show was that of placing the accessory displays in the first building entered, so that it was necessary for each visitor to pass all of the accessory exhibits before reaching the car spaces. So satisfactory was this plan, it is anticipated it will be followed again this year.

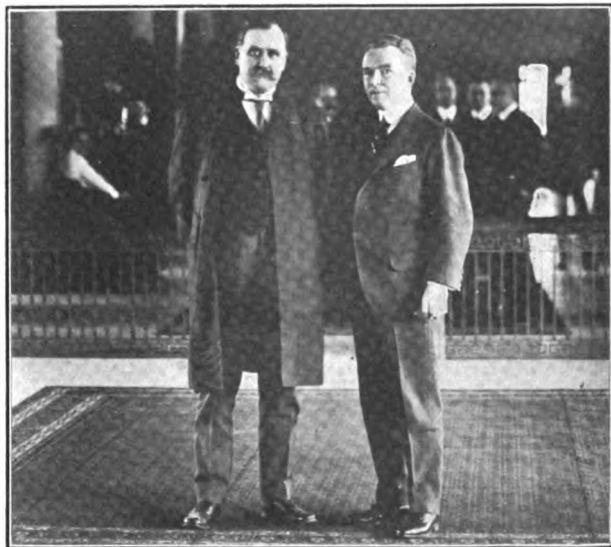
J. P. LaVigne, formerly chief engineer for the LaVigne Gear Company, Detroit, is interested in the formation of the Advance Gear Company in that city, which will produce a new type of steering gear.

### **ENTERTAINS THE GOVERNOR.**

#### **Mr. Gray of Gray & Davis Takes Pleasure in Showing Him Over the New Plant.**

The new plant of Gray & Davis, Inc., in Cambridge, Mass., has held much of interest for the people of Massachusetts and other states, since it was opened late in 1913. Many distinguished visitors have presented themselves for a personally conducted tour of the building, to observe the modern manufacturing methods employed there and to watch the construction of the Gray & Davis starting and lighting systems, with which so many cars are now being fitted as standard equipment.

An accompanying illustration shows Eugene N. Foss, then governor of Massachusetts, and



**Former Governor Eugene Foss at Gray & Davis Factory.**

Mr. Gray of the company, upon the occasion of the former's visit to the plant during the closing days of his administration. His Excellency was much interested in the plant, which is one of Boston's largest industrial buildings, and spent a great deal of time watching each step in the manufacture of the electric equipment.

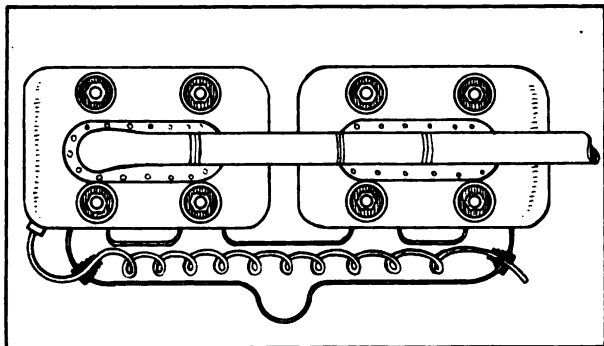
The many friends of H. R. Pickering, advertising manager for the New York & New Jersey Lubricant Company, New York City, will learn with deep regret of his death at his home in Roselle, N. J., Jan. 2. He had been in poor health for the past two years, but had been able to continue his active duties until within a very few days before the end came, and had planned to be present at the New York show.



## SUGGESTIONS FOR THE REPAIRMAN.

### Novel Method of Hot Water Jacketing the Intake Manifold by Utilizing Coil of Tubing---Inexpensive Mold for Casting Bearings.

**A** NEW YORK concern employing a fleet of commercial vehicles offered a bonus to the driver who obtained the greatest mileage on



**Novel Use of Spiral of Tubing in Intake Manifold and Using Hot Water from the Water Jacket of Cylinder.**

the lowest fuel consumption, and the prize was won through the invention and application of heat to the mixture, but in a manner differing from the usual methods. Not wishing to sacrifice the smooth running of the motor, and after trying several devices for increasing the mileage, the plan of heating the mixture within the intake manifold was tried and it is stated that excellent results were obtained.

The plan is shown in an accompanying illustration and it is very simple, although it involves a little labor. It consists of utilizing a coil of copper tubing inside of the manifold, and connecting the pipe with the water of the circulating system.

As will be noted by the drawing, one end of the tubing is tapped into the water jacket of the fourth cylinder and the other end to the pump, thereby forming a hot water circuit from the jacket, through the coil, and back to the pump. The copper tubing is bent to form a helix, and with annealed pipe it is an easy matter to obtain the required spiral on an ordinary broom handle.

Two half-inch holes are drilled in the intake manifold, through which the coil of tubing is threaded. The openings are closed by two small brass bushings, these also serving to retain the tubing in position. Auxiliary air is eliminated by sweating the tubing to the bushings. By the use of an ordinary pipe union at each end of the coil, the tubes leading to the water jacket and

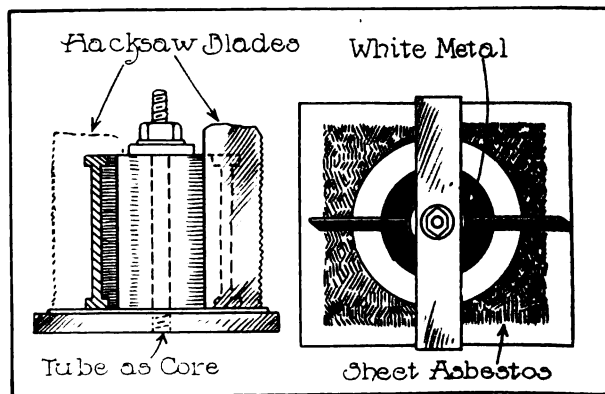
pump are attached as shown in the drawing.

The driver points out that two advantages are obtained by the device. First, the incoming mixture is given a swirling motion, thereby breaking up any particles of fuel not vaporized by the carburetor; second, the heat prevents the possibility of condensation of the fuel and also makes for a more homogeneous mixture. It is stated that considerably more mileage was obtained from a gallon of gasoline and that the operation of the motor was improved.

### REBABBITTING BEARINGS.

In rebabbitting bearings it is important that the surfaces be clean in order that the anti-friction metal will adhere to the caps. The following method is suggested by the winner of the prize contest conducted by the Commercial Motor, an English print. The illustrations show the simplicity of the plan and it will be noted that a tube and portions of hacksaw blades form the core. It is pointed out that the most essential feature is the use of a .375-inch diameter Whitworth hole. This should be tapped through the centre of a small face plate to accommodate a clamping bolt.

A piece of asbestos, the overall size of which should be larger than the two halves of the bearing caps when placed together, is utilized, and a



**Easily Constructed Mold for Pouring Bearings, a Tube and Hacksaw Blades Forming the Core.**

hole drilled in its centre, slightly larger than that of the plate. The core is provided by iron piping of various diameters and according to the



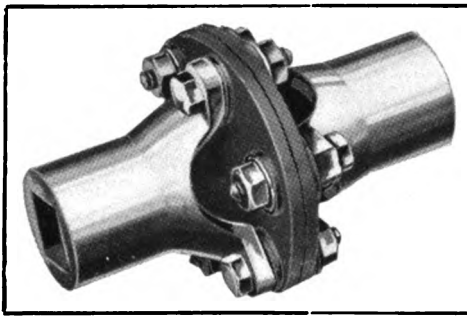
size of bearings to be rebabbitted. The retaining bolt for the bearings is made from a piece of rectangular mild steel, having a .375-inch hole drilled through, and this placed across the top edge of the bearings serves as a clamp. Before tightening the brasses down, two pieces of hacksaw blades are placed between the two halves, so

as to separate the metal during the pouring.

Previous to placing the tube in position, it should be well coated with lamp black to prevent the metal sticking. The caps should be heated previous to the pouring and the caps clean. It is stated that the work results in a casting free from flaws.

## GARAGE AND REPAIR SHOP EQUIPMENT.

**A** NEW style of universal joint termed the L has been brought out by the Blood Bros. Machine Company, Kalamazoo, Mich. The new



New Blood Universal Joint.

design is particularly adapted for use on cycle cars, and the maker states that it has been thoroughly tested. Where the angles are not over five degrees it is held that the new style is as durable and efficient as other types of joints.

As will be noted by the accompanying illustration, there are no bearings in the new joint. The two ends are connected together with heavy leather discs or rings that permit of flexibility without any lost motion or friction. Durability is emphasized in the construction. The maker states that owing to their simplicity and few parts, they can be produced at a cost considerably lower than that of the conventional types.

### MINIMAX PUMPING OUTFIT.

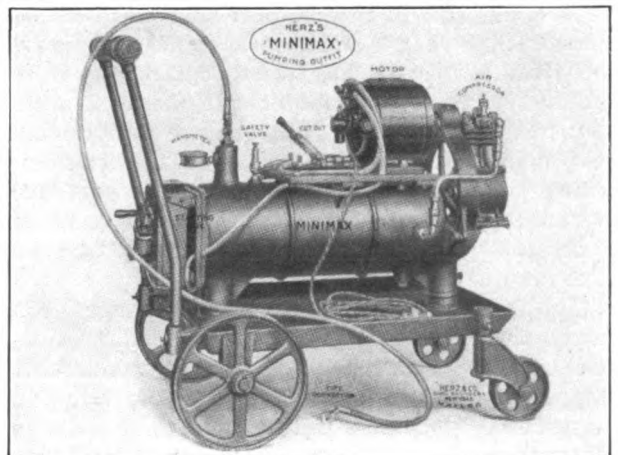
Herz & Co., New York City, is marketing a portable type of electric air compressor, termed the Minimax garage pumping outfit. It is a complete air compressor equipment mounted on a truck having a convenient handle for moving the unit as desired. A feature of the truck is the use of a metal tray which is sufficiently large to accommodate tools in addition to the motor, pump and tank.

The air compressor is a double-cylinder pump with cranks set at 180 degrees. The cylinders have a bore of 1.375 inches and stroke of 2.5, and the operating speed is 400 revolutions a minute. The height is 11 inches, width 3.5. The electric

motor is rated at .25 horsepower, and is supplied for direct or alternating current and different voltages. The gears driving the pump are accurately cut, of high grade material, and are enclosed by a guard.

The tank is of cast iron, and all air passing to it flows through a check valve of special design. The tank is 20 inches long and nine inside diameter. The capacity of the tank is equivalent to 5.5 gallons of water. It is tested to a safety pressure of 250 pounds. A safety valve is placed behind the manometer and may be set to a pressure up to 125 pounds, and the valve is stated to be very accurate in its action and will not require attention.

One of the qualities of the equipment is that all wires between the motor and the switch are carefully protected against damage or leakage of current. Connection to the supply of electricity is by a cord and a lamp socket. The equipment includes a starting switch and suitable length of steel covered hose to connect with the tire, etc. The maker states that the Minimax will inflate several tires from the supply in the tank and that the cost of operating is but a few cents a day. The workmanship and material are first class in every respect. Price list and complete details of the Minimax equipment will be forwarded on request.



Minimax Garage Pumping Outfit Marketed by Herz & Co.



## ACCESSORIES AT THE BOSTON SHOW.

**S**INCE it became known that the Motor & Accessory Manufacturers had declined to issue a sanction for the big Boston show this year, thus confining exhibits by the makers themselves to the national displays in New York and Chicago, there has been much interest in the result of this action. The show will be held March 7-14, and sufficient information is now at hand to make possible a definite prediction with reference to this phase of the situation.

Members of the Motor & Accessory Manufacturers will be unable to make display direct as in past years, but they will be represented by jobbers, and in many instances these jobbers have made arrangements with the factory to ship the exhibits used at New York and Chicago direct to Boston, so that, in effect, this portion of the accessory display in Boston will be exactly like that made in the national shows. In addition, many members of the association who were not represented in New York or Chicago, particular reference being made to several well known tire concerns and makers of other lines, will be represented in Boston through jobbers. This, in itself, is sufficient indication that the accessory department in Boston will be larger and more complete than elsewhere in the country, but, in addition, several concerns who are not members of the association have applied for and have received space allotment. In fact, there have been so many applications for space in this department that effort is now being made to secure additional room.

Of course, the pleasure car department will retain its position of supremacy. The Boston show has long held first place among the exhibitions in this country for number of makes on display, and in this respect there will be no change this year. During the past two years the Boston display has been remarkable from the fact that several motor car manufacturers have waited until that time before announcing new models, and there is every reason for anticipating that this plan will be followed yet once more. Applications already have been received from motor car producers who are not to be seen at either of the national shows.

Its reputation as a business producer has placed the annual Boston show in a class by itself, and, as in past years, there is considerable competition between those concerns not already represented by dealers in that city. The show is given under the auspices of the Boston Automobile Dealers' Association, and members of that

organization have first choice in the awarding of space. Those who do not have representation in New England are particularly anxious that their product shall be so placed that full opportunity may be had to make comparison, and for this reason applications are made early. This gives the show management opportunity to announce definitely that the number of makes will exceed those seen either in New York or Chicago.

The decision of the Automobile Chamber of Commerce to hold no national show of commercial vehicles this year, gives Boston still another opportunity to lay claim to premier honors. There is little doubt that the exhibition of motor trucks and business wagons, with their accessories, which will follow that of pleasure cars, March 17-21, will prove the most important event of this character during 1914. The number of actual sales which resulted during the Boston commercial vehicle displays of 1912 and 1913 has had its effect upon the dealers and manufacturers, and the advance application for space has been exceedingly large.

As stated, the pleasure vehicle show will be under the auspices of the Boston Automobile Dealers' Association, while the commercial vehicle display will be in charge of the Boston Commercial Motor Vehicle Association. Both will be held in the Mechanics' building, and both will be under the personal direction of Chester I. Campbell, who has been manager of all the automobile, motor boat and aeroplane shows held in that city.

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Judge F. A. Geiger of the United States district court for the eastern district of Wisconsin, has issued a decree, granting a permanent injunction against the C. A. Shaler Company of Wau-pun, Wis., prohibiting the production of portable vulcanizing devices for tires containing or embodying the invention protected by the so-called Adamson patent, No. 1,057,911. The action was brought by the Adamson Manufacturing Company of East Palestine, O.

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The annual show of the Kansas City Motor Car Dealers' Association will be held in Convention hall, Feb. 16-22, under the management of E. E. Peake, secretary of the association. Already all of the space set aside for the display of pleasure cars and trucks has been taken, and no dealers will be represented in this section except those who are members of the organization.



## GENERAL NEWS OF THE INDUSTRY.

### Hess-Bright Company Loses Suit Against the J. S. Bretz Company---Briscoe Freres Secures Factory in Jackson, Mich.---Other Changes in Production Plans.

JUDGE McPherson of the United States district court in Philadelphia has handed down a decision in the suit of the Hess-Bright Manufacturing Company of that city and the Deutsche Waffen und Munitions Fabriken of Germany, against Hedwig Fichtel and Ernst Sachs of Germany, doing business as Fichtel & Sachs, and their exclusive American representative, the J. S. Bretz Company of New York. Decision is for the defendants.

The action was brought in 1911, and the complaint alleged infringement of the so-called Conrad patents, covering, among other features, the continuous and uninterrupted race type of construction in a ball bearing. The patents are owned by the German concern first named above, the Hess-Bright company being its exclusive American licensee. The decision is of importance, as it is held to apply to the ball bearings made by a large number of concerns, including the makers of the Malliet et Blynn of France, R. I. V. of Italy, Schafer, H. C. B., Ideal and Rhineland of Germany, S. R. O. of Switzerland, and New Departure and U. S. in this country.

It is understood that the Hess-Bright interests will take an appeal and that further action will be prosecuted with vigor.

#### SINGER AGAIN PRESIDENT.

##### Replaces Clyde D. Knapp as Head of Palmer & Singer Manufacturing Company.

At a special meeting of the board of directors of the Palmer & Singer Manufacturing Company, Long Island City, N. Y., Dec. 31, Clyde D. Knapp retired from the presidency of the concern, and Charles A. Singer, Sr., was elected to fill the vacancy. Mr. Singer was for many years president of this company, previous to Aug. 27, 1913, at which time he retired and Mr. Knapp was promoted from the office of vice president.

It was announced at that time that Mr. Singer had been relieved of the duties of president in order that he might be free to devote his entire time and attention to the production of the new Palmer-Singer models, fitted with the Magic motor. It is assumed that the announcement of these new models may have had some connec-

tion with the most recent action of the board.

As an indication of the esteem in which Mr. Singer is held by his fellow associates, it may be stated that upon the occasion of his re-election the officers and employees of the company presented him with a beautifully engraved, gold inlaid, silver cigar case, with an appropriate inscription thereon.

#### BENJAMIN BRISCOE'S CAR.

##### Lewis Spring & Axle Company to Produce American Models for Briscoe Freres.

By a contract, the terms of which became known Jan. 1, the Lewis Spring & Axle Company, Jackson, Mich., becomes the American manufacturing end of Briscoe Freres of Paris, France. The company is said to be equipped with a factory and machinery valued at \$1,400,000, and to be in an excellent position to produce the new machines.

Briscoe Freres is composed of Benjamin and Frank Briscoe, who are already well known to the American automobile industry, through their connection with the old Maxwell-Briscoe Motor Company, the United States Motor Company, and a number of other concerns. The new car was first revealed at the recent Paris Salon, and is being displayed at the national shows in this country.

It is stated that for a long time the Jackson company has been making a large number of parts for automobiles, these not being confined to the items indicated by the firm name. A portion of the plant has been devoted to the manufacture of motors. Briscoe Freres believes the Lewis Company is eminently well fitted to take charge of American production of Briscoe line.

#### CONNERSVILLE CONCERNS UNITE.

##### Makers of Howard and Lexington Cars Combine Under New Charter.

A certificate of incorporation has been filed with the secretary of state in Indianapolis, Ind., for the Lexington-Howard Company of Connorsville, with capital of \$150,000. It is under-



stood that this is the result of a combination between the Howard Motor Car Company and the Lexington Motor Car Company, and that the new concern will produce both the Howard and the Lexington cars.

The directors of the new company are E. W. Ansted, J. E. Huston and F. I. Barrows. It is stated that machines will be produced on a large scale during the coming season.

### BUICK'S ANNUAL REPORT.

#### Flint Company Makes Public the Statement of Its Financial Condition.

The Buick Motor Company, Flint, Mich., has filed a statement of its financial condition, dated Dec. 9, 1913, which gives the following figures:

| Assets.                          |              |
|----------------------------------|--------------|
| Real estate .....                | \$72,284     |
| Machinery .....                  | 51,669       |
| Material, stock in process ..... | 5,638,927    |
| Furniture .....                  | 61,984       |
| Cash and debts receivable .....  | 4,453,951    |
| Investments .....                | 516,400      |
| Other assets .....               | 4,370,321    |
| Total .....                      | \$15,065,536 |
| Liabilities.                     |              |
| Capital stock .....              | \$2,500,000  |
| Accounts payable .....           | 2,189,094    |
| Floating debt .....              | 2,013,099    |
| Surplus .....                    | 8,363,343    |
| Total .....                      | \$15,065,536 |

### TO PRODUCE KEETON CARS.

#### American Voiturette Company Assumes Manufacture of Large Machine.

Announcement is made by Charles B. Shaffer, president of the American Voiturette Company, Detroit, that it has completed arrangements with the Keeton Motor Company of that city, whereby the Keeton cars will be produced by the former concern in the future. It is understood that outward appearance and name of the Keeton will remain unchanged, while the mechanical construction and details will be given every consideration consistent with sound engineering practise.

The American Voiturette Company was organized early last year for the purpose of producing the Car-Nation, in three models. This machine has been classified as a cyclecar, insofar as the two two-passenger models are concerned; but it is also produced as a touring car. Many of those interested in the manufacture of the Keeton machine were connected with the other company, although some of these withdrew from the older concern last summer.

Mr. Shaffer was a minority stockholder in the Keeton company. The other officers of the American Voiturette Company are: Vice president and general manager, W. H. Newsom; secretary and treasurer, C. B. Lewis; assistant secretary and treasurer, C. P. Jones.

It is explained by Mr. Shaffer that, owing to the fact that the field for a car of the class and type of the Keeton is somewhat limited, it has been decided best to have it made in conjunction with the Car-Nation. He adds that the company will build a limited number of the new Keetons for the 1914 season, but every one of them will be of the quality and construction that makes a car a continual source of pride and satisfaction to the owner.

### IS NOW SALES MANAGER.

#### C. F. Ames Retires from Cushion Wheel Concern to Enter Tire Field.

Cortland F. Ames, who has been located at 1241 South Michigan boulevard, Chicago, as distributor of the Sewell cushion wheels for motor trucks, has resigned all connection with that product to take the position of sales manager for the Devine Tire Company. His office is now at 2021 Michigan avenue, Chicago.

The Devine Tire Company produces the Devine indestructible fabric tire, which is said to be composed entirely of cotton duck. It is maintained that it cannot be cut, torn or chipped off, under the most severe service, and that it will give maximum traction under all conditions of road surface.

### HAVOLINE VS. VALVOLINE.

#### United States District Court Holds There Is No Unfair Competition.

Judge Mayer of the United States district court for the southern district of New York has handed down a decision in the case of the Valvoline Oil Company of New York City against the Havoline Oil Company and the Indian Refining Company, which controls the Havoline product, also of that city, in which it is held that the similarity of the names is not such as to constitute an infringement of trade mark rights. The plaintiff asked for an injunction restraining the defendants from using the name in connection with the production and marketing of automobile lubricants.

Judge Mayer finds no similarity in the con-



tainers or labels, or in their colors. In his opinion there is sufficient difference in the two names so that they do not convey the same meaning to the purchaser. The complaint is therefore dismissed.

### DIVIDES WITH EMPLOYEES.

#### Ford Motor Company to Distribute \$10,000,000 Among Its Men in 1914.

Announcement is made by James Cousens, treasurer of the Ford Motor Company, Detroit, that that concern will divide some \$10,000,000 among its workmen during 1914. The plan is outlined in the following statement:

We have estimated our earnings for the coming year at \$10,000,000, and, dividing as we go, or, in other words, as we earn it during the year, will distribute \$10,000,000 in the pay envelopes in semi-monthly payments. Our firm belief is that the division of earnings between capital and labor is not fair at present and that labor is entitled to a greater share. We desire to express our belief in this direction in some practical way and have therefore adopted this plan.

It means in substance that no man over 22 years of age will receive less than \$5 for eight hours' work. Others will be compensated in relation to their value, using \$5 per day as the minimum. We have reduced our hours from nine to eight and are running 24 hours per day. We hope to carry out this plan during 1914, and whatever future plans we make are dependent upon conditions; but we hope to be able to make a further distribution at the end of the year, after having laid aside proper amounts for dividends, extensions and the construction of assembly plants throughout the country.

The minimum wage per day, outside of the distribution in pay envelopes, is now \$2.34 for nine hours, which has now been reduced to eight hours. We believe this distribution from day to day will enable the men to improve their living conditions and to be prepared in case of sickness or other misfortunes. Men under 22 years of age will be dealt with as their individual circumstances appear best to us; it being the intention where they are industrious, honest and saving to do the same with them as with others, as soon as our investigations have been concluded. Men under 22 years of age, who are the support of their parents or younger brothers and sisters, will be promptly put on the same basis. We hope to so arrange our production that, in case it is ever necessary to shut down or to slow up, we will do so during the months of harvest, so the farmers may be supplied with men from our plant.

This may not be a plan for any other concern but ours, but we are in hopes that other employers will recognize the unequal distribution of earnings and endeavor in their own way to make a better division.

### SPARK PLUG ORGANIZATION.

#### Forty Manufacturers Meet for This Purpose During New York Show.

One of the important gatherings during the week of the New York automobile show was that of some 40 manufacturers of spark plugs, which was called at the instance of A. R. Mosler, president of A. R. Mosler & Co., Mount Vernon, N. Y. The meeting followed a banquet at the Hotel Astor, at which the guest of honor was

William A. Redding, patent attorney, and the chief topic of discussion was the recent decision respecting the so-called Canfield spark plug patent.

A second meeting will be held in the near future for the purpose of completing the organization of the spark plug manufacturers, and to this end the following committee was appointed: D. B. Mills, Rajah Supply Company; Albert Champion, Champion Ignition Company; R. A. Stronohan, Champion Spark Plug Company; David Smith, Standard Company; E. H. Schwab, Silvex Company, and Otto Heinze, Bosch Magneto Company.

It is expected that the organization will be composed of manufacturers licensed to produce spark plugs under the Canfield patent, which is owned by the Mosler company. It is stated that 23 leading manufacturers already hold such licenses.

### NEW CONTEST HEAD.

#### Kennerdell Succeeds Schimpf—Vanderbilt and Grand Prize in February.

At a meeting of the executive board of the American Autotomobile Association, held in New York City during the progress of the show, Richard Kennerdell of Franklin, Penn., was selected as chairman of the contest board, vice William Schimpf of Brooklyn, N. Y., who assumed the position upon the death of S. M. Butler, during the Glidden tour of 1911, and was re-elected for 1912 and 1913. Mr. Schimpf declined further re-election, and Mr. Kennerdell is considered an excellent choice, from the fact that he has long been interested in contest work, dating from the bicycle days, and is in a position to do considerable travelling so as to be present at various important events.

The contest board also decided upon definite dates for holding the 1914 Vanderbilt Cup and Grand Prize events. The former will be held Feb. 21 and the latter Feb. 28. Although sanctions actually have not been granted, it is expected that they will be issued early next month. The races will be held over the Santa Monica course, and the details are being arranged by Leon T. Shattler of Los Angeles, who was in New York during the show for the purpose of interesting manufacturers and others.

The national good roads board was empowered to hold a federal aid conference in Washington in connection with national roads legislation. A committee, consisting of L. R. Speare,



S. A. Miles and A. G. Batchelder, has been appointed to arrange for a midsummer meeting of the association to be held in the White Mountain region of New Hampshire.

### BRISCOE MOTOR COMPANY.

**Organization Perfected in New York with Horace DeLisser as President.**

Elsewhere in this issue appears a statement that the Lewis Spring & Axle Company, Jackson, Mich., is to produce the Briscoe car in this country for the Briscoe Freres of Paris, France. This statement is a trifle misleading, in the light of subsequent events, although it is now understood that this company will actually manufacture the machines for the Briscoe Motor Company, which was organized in New York City, Jan. 6.



**Horace DeLisser, President, Briscoe Motor Company.**

It would appear that the Briscoe Motor Company was the American representative of Briscoe Freres. At the organization meeting in New York, Horace DeLisser, formerly associated with Benjamin Briscoe, the former as vice president and the latter as president of the United States Motor Company, and now with the Ajax-Grieb Rubber Company, was elected president. It is understood that he will not sever his connection with the tire concern, at least for the present. The other officers are: Vice president, W. F. Smith; secretary and treasurer, L. E. Latta.

### NEW PUMPING OUTFIT.

**Gemmer-Detroit Starter Company Making Display at New York and Chicago.**

The Gemmer-Detroit Starter Company, 712 Ford building, Detroit, exhibited at New York,

and will display at Chicago, a new portable air storage pumping outfit. This is made in two sizes, one being intended for public garage service and the other for private and smaller public garages.

The larger outfit is equipped with a tank of sufficient capacity to fully inflate 15 34 by four-inch tires or partially inflate 30 or more. It also comprises a four-cylinder pump, with bore of 1.5 inches and stroke of 1.75. The smaller equipment has a two-cylinder pump, with bore and stroke of 1.5 inches, and a tank with sufficient capacity to fully inflate six 34 by four-inch shoes, or partially inflate 12 or more.

The pumps of both outfits are driven by standard electric motors at such speed that the smaller tank will be filled from zero to 150 pounds pressure in about 18 minutes, or replenished from 75 pounds in 10. The larger has such capacity that the tank will be filled from zero to 175 pounds in 20 minutes and replenished from 75 in about 14 minutes.

Another feature of these is held to lie in the construction of the running gear, which consists of strong metal strips welded directly to the tanks. The wheels are rubber tired and of the swivel type, which permits the outfit to be moved easily in any direction. The handle always is held in an upright position by means of a spring. Valves and pipe connections are used throughout so as to prevent leakage. The pumps have cast iron pistons and rings, special bronze connecting rods and ground crankshafts.

Louis H. Moos, trustee of the Carhartt Automobile Sales Company, has issued an announcement that assets of that company will be sold at public auction at Morgan & Bros.' storage warehouse, 232 West 47th street, New York City, Jan. 15, at 10:30 in the morning.

The 12th annual automobile show of the Cleveland dealers will be held in that city Jan. 10-17. The event is under the auspices of the Cleveland Automobile Show Company, the sanction and co-operation of the Cleveland Automobile Club, and the active management of Fred H. Caley.

The employees of the Republic Rubber Company, Youngstown, O., will hold a formal opening of their new clubhouse in that city Jan. 15. The following compose the board of governors: Chas. A. Miller, Daniel Evans, Oscar Watkins, N. W. Sayles, C. C. Porter, A. H. Harris, Jacob Dieter, J. H. Kelly and Thomas L. Robinson.



## EFFECT OF NEW TARIFF ON IMPORTS.

SOME little interest attaches to the first monthly report of the Department of Commerce since the new Underwood tariff went into effect. This applies particularly to the automobile industry, because the rate on chassis was reduced from 45 per cent. to 30 per cent. By far the larger proportion of foreign cars shipped to this country are sent in with stripped chassis, the bodies being constructed on this side. It readily will be seen that the new tariff should have an important bearing upon the number of machines imported into the United States.

At the other hand, it will be conceded that the results as indicated by the first monthly report hardly can be regarded as a criterion, since the new rate was decided upon in conference a few hours before the bill was enacted into law. It will be understood, therefore, that an intending purchaser would have little opportunity to give an order and have it filled during this first month.

The new law went into effect Oct. 4, and the report covers the month of October after that date, the entries for the first three days under the tariff law of 1909 being included in the report for September, previously presented in these columns. The report for October shows the following, as compared with the same month in the year 1912:

| Country—             | 1912 |           | 1913 |          |
|----------------------|------|-----------|------|----------|
|                      | No.  | Value     | No.  | Value    |
| France .....         | 51   | \$105,754 | 15   | \$38,961 |
| Germany .....        | 1    | 762       | 1    | 8,000    |
| Italy .....          | 7    | 13,324    | 6    | 11,455   |
| United Kingdom ..... | 8    | 24,318    | 5    | 16,691   |
| Other countries..... | 11   | 26,252    | 2    | 4,539    |
| Totals.....          | 78   | \$170,410 | 29   | \$74,646 |

It would appear from this tabulation that there had been a decided falling off in the matter of imports, even though the duty was reduced one-third. The figures are of interest as having a bearing on the subject, although they probably do not offer any conclusive evidence as to the manner in which the new tariff rate will affect the industry.

In this connection it also is of interest to note the report with reference to exports of automobiles during the same period. The following tabulation gives these figures, in comparison with those for the same month in 1912:

| Country—               | 1912 |             | 1913 |             |
|------------------------|------|-------------|------|-------------|
|                        | No.  | Value       | No.  | Value       |
| France .....           | 42   | \$24,820    | 59   | \$35,759    |
| Germany .....          | 45   | 45,432      | 32   | 27,923      |
| Italy .....            | 13   | 9,785       | 18   | 19,172      |
| United Kingdom .....   | 265  | 219,578     | 283  | 250,298     |
| Other Europe .....     | 62   | 54,103      | 82   | 91,421      |
| Canada .....           | 405  | 491,133     | 298  | 423,016     |
| Mexico .....           | 17   | 30,719      | 24   | 41,354      |
| West Indies, etc. .... | 35   | 32,418      | 35   | 36,110      |
| South America .....    | 191  | 202,610     | 182  | 181,230     |
| British Oceanica ..... | 264  | 230,665     | 356  | 310,163     |
| Asia .....             | 186  | 167,072     | 231  | 221,694     |
| Other countries .....  | 87   | 75,477      | 176  | 150,087     |
| Totals.....            | 1612 | \$1,583,812 | 1776 | \$1,788,222 |

## COMPARATIVE COMPILATION FOR FIRST 10 MONTHS.

| Exports—                | 1911   |              | 1912   |              | 1913   |              |
|-------------------------|--------|--------------|--------|--------------|--------|--------------|
|                         | No.    | Value        | No.    | Value        | No.    | Value        |
| France .....            | 336    | \$413,030    | 585    | \$439,313    | 714    | \$546,090    |
| Germany .....           | 95     | 112,121      | 392    | 316,201      | 890    | 775,466      |
| Italy .....             | 167    | 192,339      | 254    | 224,436      | 277    | 241,180      |
| United Kingdom.....     | 2,776  | 2,407,373    | 4,207  | 3,163,696    | 4,183  | 3,184,530    |
| Other Europe.....       | 685    | 635,378      | 1,340  | 1,098,761    | 1,565  | 1,355,249    |
| Canada .....            | 4,800  | 4,770,911    | 6,393  | 7,704,772    | 5,558  | 7,473,333    |
| Mexico .....            | 210    | 351,007      | 198    | 320,592      | 199    | 362,733      |
| W. Indies and Bermuda   | 236    | 270,994      | 273    | 283,116      | 405    | 397,538      |
| South America .....     | 766    | 967,358      | 1,586  | 1,817,988    | 2,271  | 2,554,210    |
| British Oceanica.....   | 1,729  | 1,602,383    | 2,849  | 2,586,185    | 2,774  | 2,585,389    |
| Asia and other Oceania. | 645    | 647,067      | 1,321  | 1,310,323    | 2,001  | 1,969,777    |
| Other countries.....    | 221    | 238,161      | 620    | 570,728      | 1,892  | 1,644,585    |
| Totals.....             | 12,196 | \$12,608,127 | 20,018 | \$19,836,111 | 22,729 | \$23,090,080 |
| Imports—                | 1911   |              | 1912   |              | 1913   |              |
|                         | No.    | Value        | No.    | Value        | No.    | Value        |
| France .....            | 262    | \$567,665    | 384    | \$914,639    | 158    | \$370,272    |
| Germany .....           | 129    | 280,385      | 45     | 105,131      | 78     | 205,931      |
| Italy .....             | 100    | 159,188      | 80     | 129,551      | 74     | 137,373      |
| United Kingdom.....     | 127    | 305,531      | 115    | 278,583      | 42     | 128,993      |
| Other countries.....    | 155    | 344,512      | 70     | 145,680      | 65     | 140,876      |
| Totals.....             | 773    | \$1,657,281  | 694    | \$1,573,584  | 417    | \$983,445    |

These two tabulations indicate that while there was a decrease in imports amounting to very nearly 57 per cent., there was a gain in exports of approximately 13 per cent. The balance of trade appears to be very greatly in favor of the United States, and this is still further indicated in the accompanying tabulation for the first 10 months of 1913.

A new ordinance has been passed by the city council in Chattanooga, Tenn., which stipulates that every motor vehicle "be equipped with a Klaxon or other signal sufficient in character and volume to give ample warning to pedestrians and drivers of vehicles". It also rules against the unnecessary use of signals by providing that they shall be used only "as a warning of danger".

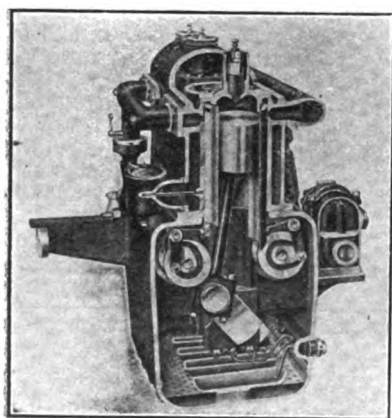


## INTERESTING NEW TYPES OF MOTORS.

**Speedwell and Westinghouse Rotary Valve Models—Fischer-Magic Crescent Valve Design—Carter Piston Valve—Weidely Overhead Camshaft Distinctive.**

**W**HETHER or not the poppet valve motor is eventually to be replaced by some other type of engine, as is maintained by engineers who are working upon these new types, it is certain that there is decided interest in the subject on the part of both manufacturer and user. There are today seven American makes of automobiles fitted with four different types of non-poppet valve engines, as follows: Stearns, Lyons, Moline and Willys with the Knight; Speedwell with the Mead; Palmer-Singer with the Magic, and Great Western with the Carter.

The Knight motor is regarded as the first successful non-poppet valve engine, and its constructional features are fairly well understood, although the details have been worked out a trifle differently in the several cars employing the design, in brief, it is a sliding sleeve valve type, in which



**Sectional View of Magic Motor, Showing the Crescent Valves and Cams.**

one sleeve operates within another, and both are located within the cylinder, between the cylinder wall and piston.

### **Rotary Valve Designs.**

The engine utilized by the Speedwell was announced as optional equipment with that car during the New York show of 1913. It is now standard, but the purchaser has an option of securing the older Speedwell poppet valve motor if he so desires. In other words, the conditions are exactly the reverse of what was true a year ago. It does not seem necessary to include a description of this engine in this discussion, beyond recalling that it is a rotary valve design, in which there has been little change, except in refinement of details making for more efficient operation of the valve cylinders, which lie along the top of the motor casting at either side.

Several other rotary valve engines have made their appearance in this country in an experimental way, and a number of motor car manufacturers are known to have been very much interested in them. One of the newest is that now being considered by the Westinghouse Machine Company, Pittsburg, Penn. It is impossible to give full details concerning this motor, because the company is not yet ready to make them public. However, it may be stated that it is designed to employ but one rotary valve, that being located directly in the head.

### **Westinghouse Valve Cylinder.**

A portion of the valve cylinder, which is hollow, is cut away, or nicked, to form a means for conveying the incoming mixture and exhaust. As the valve cylinder revolves, this nicked portion registers with the intake and exhaust manifolds in turn. It will be understood that the interior of this cylinder is circular in form except at those places where the nicks contract this contour, the nicks being so disposed as to supply each cylinder in proper timing order.

The valve cylinder is cooled by the circulation of oil. A pump at the forward end of the motor forces the lubricant up a tube to the front end of the cylinder, thence through the hollow cylinder to the rear end, whence it enters another tube and lubricates gears and bearings operating other components of the engine before being filtered and utilized again. Additional information concerning the motor is not available at this time.

### **Fischer-Magic Crescent Valve.**

The motor utilized by the Palmer-Singer, although the company is still producing a car equipped with a poppet valve engine, had its origin in Switzerland, where it is known as the Fischer. In America the design has been termed the Magic, and it is so designated by the Palmer & Singer Manufacturing Company, which is a licensee of the Fischer Motor Corporation of New York City. The design is termed a crescent valve motor.

In an accompanying illustration, these crescent valves may be noted at either side of the cylinder. The inner concave surface is in contact with the piston and is flush with the cylinder walls. The outer convex surface is in contact



with the water jacket, and is ribbed to permit of efficient lubrication at that point. Each valve extends the entire length of the cylinder, and is operated by a cam at the lower end.

The mixture enters and leaves the explosion chamber through openings near the top of the valve. Both valves are held in their correct position in the walls of the cylinder by the piston rings and the so-called master ring in the cylinder head. Whenever the valve moves, as it must in order that the opening may register with the intake or exhaust manifold, as the case may be, it is with and not against the movement of the piston, thereby reducing wear to a minimum. Both valves are at rest during the explosion stroke. There are no springs, and it is maintained that the valve movement is positive, insuring full port openings and absolutely correct timing.

#### Carter Piston Valve.

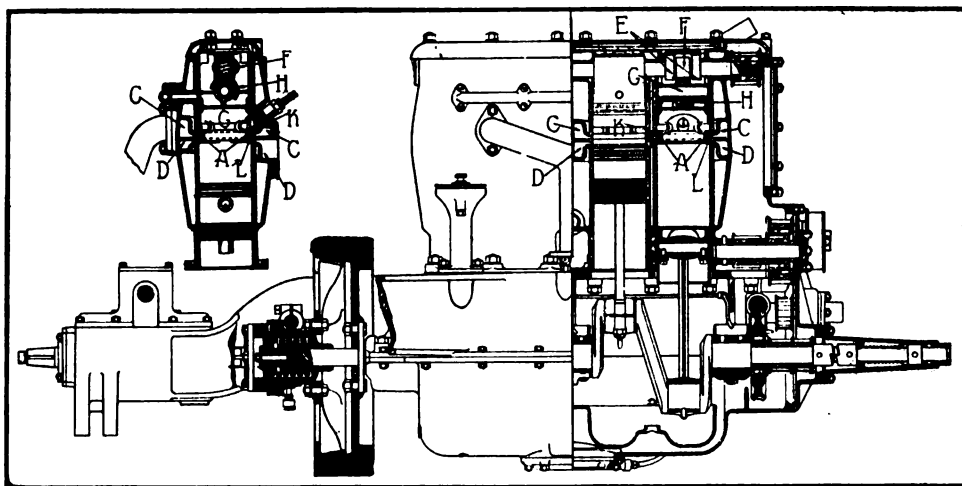
The Carter motor is made by the Model Gas Engine Works, Peru, Ind., and is offered by the Great Western Automobile Company of that city as optional equipment. It is of the piston valve type, which may be taken to mean that there is a second piston working in the cylinder above the so-called working or power piston. The cylinder is bored straight through, and the upper piston carries three compression rings, practically the same as the power piston, and on the extension at the base are two expansion rings A A, which close the intake port C and the exhaust port D as the piston is moved up and down.

The piston valve is actuated by a camshaft, being fitted at the top with a standard wristpin G and a roller H, which contacts with the central cam F. The bridge I across the top of the piston contacts with the two outside cams E E at all times, and the roller H and cam F also are always in contact. The cams are so ground that each movement of the upper piston corresponds to that of the ordinary poppet valve of the standard motor, insuring positive movement of the piston valve in either direction.

In an accompanying drawing the motor is shown with the exhaust port open and the power piston on the exhaust stroke. Beginning the suction stroke, the cam F moves the upper piston down until the intake port C is open, and the exhaust port D is closed simultaneously. Near the end of the suction stroke and the beginning of the compression stroke the position of the rings A A is indicated by the dotted lines, closing both the exhaust and intake ports. Near the conclusion of the explosion stroke the piston valve again moves upward, until the exhaust port is fully open as shown in the drawing.

#### Weidely Motor Distinctive.

One of the features claimed for all non-poppet valve motors is silent operation, and it cannot be denied that the success of these engines has resulted in decided improvement in this respect in poppet valve types. Few changes have been so radical, however, as those indicated by the new Weidely motor installed in 1914 Premier cars. This



Transverse and Sectional Views of Carter Piston Valve Motor, Revealing the Pistons, Valves, Overhead Camshaft and General Details of Construction.

is a poppet valve engine of the valve-in-the-head type, but the arrangement of the components is such as to make it decidedly distinctive in design.

The six cylinders are cast in a block with the entire crankcase and intake header. The cylinder head is another unit and carries all the valves and the camshaft, while covering it is another smooth plate that makes an oil tight housing for the valve mechanism. Even the water pipes have been eliminated, the radiator being bolted to the motor itself without rubber connections.

#### How Valves Are Operated.

The valves are large, and there are no cages, the valves seating right in the head casting. Each



valve overhangs the cylinder bore slightly, and it is maintained that in the event of a stem breaking the valve could not fall into the cylinder. There are no rocker arms, the camshaft being directly above the ends of the valve stems, but between the cams and the stem ends is the end of a very light steel finger pivoted at the outer end. This carries the adjustment by which wear may be taken up and replaces the usual valve stem adjustment.

With reference to the drawing, the camshaft C is driven by means of a worm A and worm wheel B, which is connected with another worm and worm wheel assembly on the crankshaft by means of a vertical shaft. D indicates the steel finger. Lubrication of the camshaft bearings and cams is accomplished by means of a rotary sleeve on the top of the pump, which distributes oil through a pipe leading to the centre bearing. The bearing is grooved and the camshaft is drilled so

burn, Ind., in an Imp, made by the Imp Cyclecar Company of that city, accompanied by W. B. Stout of Chicago. The party left Detroit Dec. 30 and came through to New York in nine days.

The other machine was a Zip, made by the Zip Cyclecar Company, Davenport, Ia., and driven by Hugh Hughes, well known as a racing driver. He left Chicago, Christmas Day, and the trip required 14 days.

### RUDGE-WHITWORTH WHEELS.

#### Standard Roller Bearing Company Seeks Injunction Against Houk Interests.

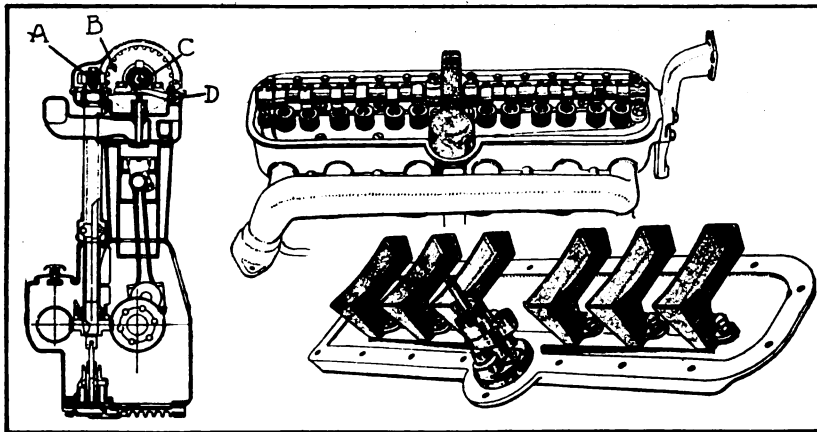
Rudge-Whitworth, Ltd., of England, and the receivers for the Standard Roller Bearing Company, Philadelphia, have brought suit against the Houk Manufacturing Company, Buffalo, N. Y., seeking an injunction restraining the last named concern from using the name Rudge-Whitworth, and also to prevent it from manufacturing and selling wire wheels embodying the features covered by the Rudge-Whitworth patents.

It is maintained by the plaintiffs that the Standard Roller Bearing Company has the sole right in the United States to use this name, and that it is the only company in this country licensed to manufacture, or have manufactured, wire wheels embodying these patents. This is the first suit brought in America

under these patents and the outcome will be awaited with interest.

**Correction of Error**—In a recent issue attention was called to the new four-story addition occupied by the Champion Spark Plug Company, Toledo, O., in which it was stated that the building gave the company 40,000 square feet more of floor space and increased the minimum capacity to 75,000 a year. The latter figure is minus three ciphers. The capacity of the plant is 75,000,000 plugs a year, or about 25,000 a day.

The Society of Automobile Engineers has made the Institution of Automobile Engineers of Great Britain a Christmas gift of a handsomely bound book containing clippings relative to the American trip of the latter organization in 1913.



Sectional View of Weidley Engine, Also Cylinder Head Carrying Valves and Camshaft, and Cover Plate.

that the passage of lubricant to the bearings is uninterrupted. The rest of the valve mechanism is bathed with oil by streams that issue from the backs of the cams. In the centre of the cylinder head casting is a well in which the camshaft gear revolves and the oil from the camshaft bearings keeps this filled so that the worm wheel turns in a bath of oil, as does the worm on the vertical shaft, and its bearings.

### TWO CYCLECARS ARRIVE.

#### Imp and Zip Make Long Overland Trips to Attend New York Show.

During the progress of the New York show, two long distance cyclecar trips came to an end in front of the Grand Central Palace. One of these was accomplished by W. H. Smith of Au-



## ACCESSORY EXHIBITORS AT NEW YORK.

Brief Description of Displays of New and Standard Supplies, Parts and Fittings Made by Prominent Concerns in the Industry at Grand Central Palace.

**A**CCESSORIES were displayed at the New York show on the third and fourth floors of the Grand Central Palace, and while there were a number of well known concerns in this field who were not represented this year, having withdrawn from all national exhibitions, the lines were generally most complete. The most noticeable absentees were among the tire manufacturers. No attempt is made herein to give a detailed description of the various lines on display, but rather to call to mind the manner in which the most prominent exhibitors in the respective sections directed attention to their products.

### Apple Electric Company.

Dayton, O.—The well known Apico electric lighting,

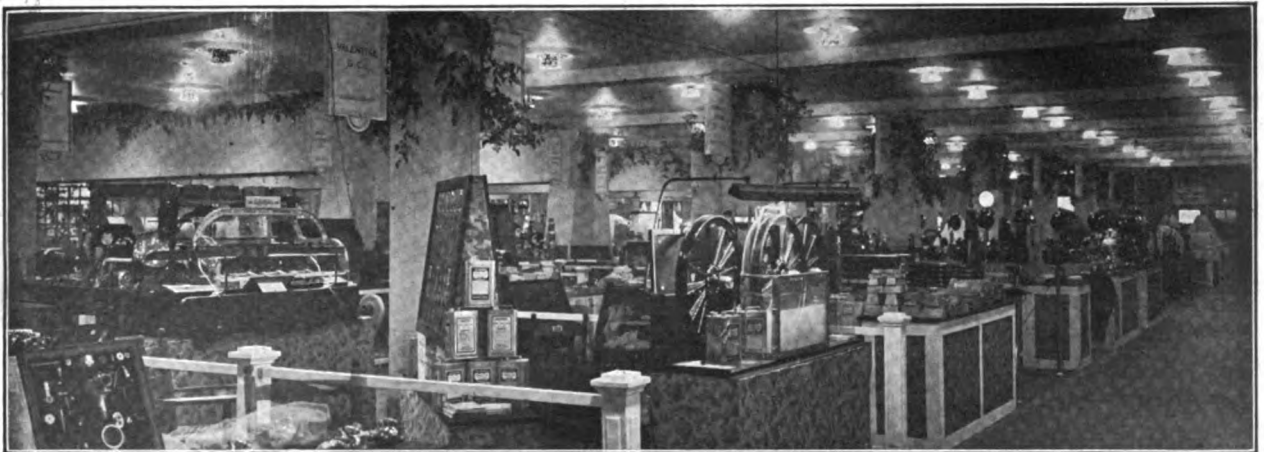
Anthony hand tire pump was another feature of the display.

### Brown Company.

Syracuse, N. Y.—In addition to the line of Brown and Brown Jr. tire pumps heretofore produced by this concern, there was exhibited a new four-cylinder gear driven pump, for which entirely new constructional features are claimed. Another new accessory for this firm was a deflecting electric headlight, equipped with a movable shade that cuts out the upper rays of light, the control being by push button. Still another was a primer for Ford cars.

### Cataract Rubber Company.

Boston, Mass.—Although the number of tire exhibitors was not as large as in previous years, there were several well known concerns in this field who made display, and among these was the maker of Cataract tires. A full line of pleasure and commercial vehicle tires was shown, these including the plain tread, break-skid tread, pneumatics and Cataract gray and Invincible red tubes, etc. The product is made on the policy that quality must never be sacrificed to quantity, and the attendants at the



General View of the Accessory Display in Grand Central Palace During 14th National Automobile Show.

starting and ignition systems occupied the centre of interest at this booth. The feature of the display was the demonstration of the self-regulating dynamo and indicating automatic switch, by which it is possible at all times to note the condition of the battery without the use of the volt-ammeter. Attention also was directed to the new Golden Glow headlights with special dimming attachment to conform with city ordinances.

### John W. Blackledge Manufacturing Company.

Chicago, Ill.—Velvet shock absorbers, comprising the use of springs within a casing, were shown at this booth in six different sizes, for cars weighing from less than 2200 to more than 4800 pounds. Some of these were demonstrated, being attached to a small car riding over a mechanical contrivance to imitate road conditions.

### Braender Rubber & Tire Company.

Rutherford, N. J.—Several of the Braender tires utilized by Ralph Mulford in long distance racing events during the past year were on exhibit. The shoes went through the entire contest in each instance without change, and were the object of much interest. The company called special attention to its Bull Dog non-skid tread, and to the red and gray tubes made by it. The

booth laid special stress upon the mileage record gained by these casings and tubes.

### Coes Wrench Company.

Worcester, Mass.—Coes wrenches were first produced in 1843 and the company has been making these for automobile use since the inception of the industry. The display included all types, from the smallest to the largest, and special attention was directed to the steel handled type, some of these being shown in section to indicate the internal support of the steel shell.

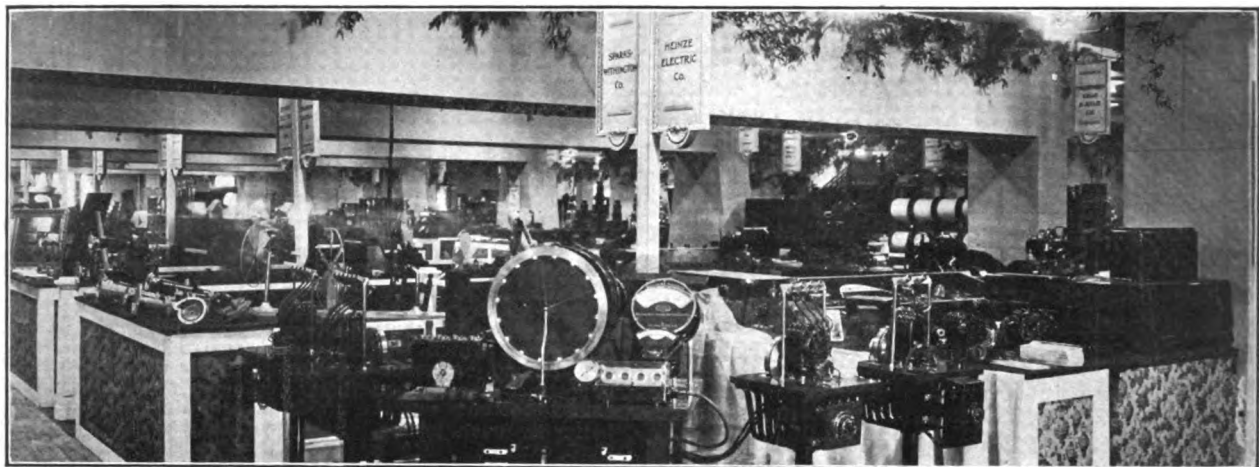
### Cox Brass Manufacturing Company.

Albany, N. Y.—A demonstration was arranged to indicate the desirability of using the Coxajusto shock absorbers and Cox rebound E-zer. The former is of the coil spring design and is held to be adjustable to every load the car may carry, while the feature of the latter is the automatic friction clamps, which open when the spring compresses and grip on the rebound. The company also called attention to its combination welding and decarbonizer outfit for garages, and to its line of windshields, bumpers, etc.

### Smalley Daniels.

Detroit—Aside from the New Era vehicle springs and other lines previously displayed by this concern, two





**A Corner of the Third Floor Devoted to the Display of Accessories, Fittings and Supplies.**

entirely new products were featured. One of these is a Ford tire carrier, with combination rear number holder and lamp bracket, made in two designs, with and without the tire trunk. The other is a collapsible water bucket, operating on the same plan as the pocket collapsible drinking glass, which is supplied in a neat case and is capable of being stowed in small space. This latter equipment includes three funnels, for water, gasoline and oil.

**Dean Electric Company.**

**Elyria, O.**—The exhibit of this company was decidedly complete in every respect, including the Elyria-Dean high frequency ignition systems, Elyria-Dean II dynamo lighting system, Elyria-Dean speedometer and Elyria-Dean battery cases. Attention also was directed to the line of electric horns, with special reference to the Maxo II for motorcycles. This is similar in every respect to the original Maxo, but is sold at a much lower price.

**Jos. Dixon Crucible Company.**

**Jersey City, N. J.**—Dudley Thurston, L. H. Snyder and O. A. Light were kept busy throughout the week explaining the merits of Dixon's graphite lubricants. Demonstrations were made of Dixon's No. 677 graphite grease for transmission and differential cases. The various packages were so arranged as to make a very attractive exhibit, and one designed to catch and hold the attention.

**Edison Storage Battery Company.**

**Orange, N. J.**—The Edison nickel-iron storage battery was displayed in such manner as to call special attention to its constructional details, and every effort was made by the attendants to explain its features in a practical way. The new type A-5 vehicle battery for light car service was made a special feature of the display, which also included a full line of batteries for ignition and lighting of gasoline cars.

**Electric Storage Battery Company.**

**Philadelphia, Penn.**—The exhibition of the well known Exide line of storage batteries for various purposes was very complete, several of the batteries being shown disassembled and in part sections so as to present the method of construction. Special attention was directed to the new type X starting and lighting battery, designed particularly for this work.

**Gray & Davis.**

**Boston, Mass.**—Besides the well known Gray & Davis electric lighting and starting system, this concern presented a new non-blinding headlight, designed to conform to the ordinances prohibiting the use of glaring headlights within city limits. A large portion of the lamp is covered with ground glass, leaving a space in the centre, through which a so-called pencil ray is projected straight ahead, while the ground glass is held to diffuse the rays about the front of the car so as to make it visible at all times.

**Green & Swett Company.**

**Boston, Mass.**—This is a new concern, organized recently to produce the Tri-Phoon three-cylinder air pump.

It differs from conventional designs in that the three reciprocating pistons are driven by a high powered rotary cam, and are controlled on the cam surface by means of roller bearings. The pump was shown complete with brackets and fittings, which make installation a simple and easy matter.

**A. W. Harris Oil Company.**

**Providence, R. I.**—This company has been manufacturing lubricating oils for over 28 years, and the line exhibited included the three grades of Harris automobile oils—heavy, medium and light—and Harris trans-compound. Various grades of machinery oils also were shown. Sample of store counter displays, designed to show the purity of these oils, were a feature of the exhibit, as also were samples of road signs, window transparencies, etc.

**Geo. A. Haws.**

**New York City**—The exhibit of Panhard oils, made by this concern, was decidedly complete and instructive. Aside from the use of the checker board cans for decorative purposes, a particularly pleasing demonstration called attention to the method of refining Pennsylvania crude, and to the difference between the various crudes. The condition of Panhard oils throughout the entire process of refinement was graphically portrayed.

**Heinze Electric Company.**

**Lowell, Mass.**—The well known line of magnetos, coils, spark plugs, timers and switches bearing the Heinze name, has been augmented by the addition of an entirely new type of oscillating magneto, which is held to possess advantages not hitherto found in the models produced by this concern. While special attention was drawn to the new magneto, a feature of the exhibit was the Heco priming spark plug, which was shown for the first time last year, and which has been improved and refined to meet the varying requirements of service.

**Herz & Co.**

**New York City**—Herz magnetos and plugs, Minimax pumping outfits, B. B. power driven air compressors, Universal flywheel pumps, and other standard Herz products were displayed as usual. In addition, special attention was directed to the Herz patent automatic time adjustment for ignition apparatus, which is held to be simple and applicable to any type of magneto, and the Herz tape grip rings, for making connection between rubber hose and metal pipe.

**Holtzer-Cabot Electric Company.**

**Brookline, Mass.**—At this booth, demonstration was made of the new JS type magneto-generator and lighting system for small cars. It is maintained that this system, although designed to meet the needs of the small car owners, is equally applicable to the large car, where it is desired to have electric side and tail lamps, but gas headlights; where the car is used largely for daylight driving; where the use of headlights is prohibited, and on the earlier types of large cars without magneto ignition, to supply current for ignition, side and tail lamps, electric horn, etc. The company also displayed its Newcomb carburetor and Reacto electric horns.



**Hudson Export & Import Company.**

**New York City**—Special attention was called to the A. V. shock absorber, made in Europe. This is held to be so constructed as to take care of both light and heavy shocks by means of a combination of hydro-pneumatic cylinders supplemented by concentric spiral springs. A special feature of the display was the presentation of a new type for Ford cars.

**Indian Refining Company.**

**New York City**—That Havoline oil "makes a difference" was the slogan which attracted attention to the exhibit made by this company. The product was displayed in packages, so arranged as to cause the visitor to become familiar not only with the trade mark, but the design of the can or other receptacle. Havoline oil is made in varying densities to meet the requirements of different motors, and this factor was not forgotten by the attendants in explaining the merits of the product.

**Janney, Steinmetz & Co.**

**Philadelphia, Penn.**—This concern had a very interesting and attractive exhibit of its seamless steel tanks. Particular attention was directed to the new shapes and forms, with new attachments, including the Steinmetz reserve compartment, which is entirely contained within the tank. The line is held to cover every style of tank that is made in the cold drawn seamless process, and the display was designed to appeal both to the user and to the consulting and designing engineers of factory departments.

**J. M. Shock Absorber Company.**

**Philadelphia, Penn.**—The J. M. shock absorbers, made in France, were effectively demonstrated on a small automobile, and the attendant was kept busy explaining the merits of the product. The device is made in four models, model A being a twin-cylinder, and the others single-cylinder. These are designed for various types of cars, the model F being specially adaptable to Fords. The construction embodies the use of helical springs encased in a cylinder.

**H. W. Johns-Manville Company.**

**New York City**—This company acts as selling agent for a number of concerns who have exhibited direct at previous New York shows. Among the products listed at this stand were the following: Jones speedometer, K. P. foot rest heater, Arnold electric heating plugs, J-M Mobillette electric lamp, Arnold electric vaporizer, J-M Fyro extinguisher, J-M dry batteries, J-M (Mezger) Soot Proof spark plugs, Mobilene packing, Non-Burn brake lining, Carter carburetor, Long horn, Noark enclosed fuses and Spark-No automobile lock.

**Kemco Electric Manufacturing Company.**

**Cleveland, O.**—The Kemco fan type generator, made by this concern, was shown for the first time at a New York display. The generator furnishes current for charging the storage battery and is designed to be mounted in place of the regulation fan in front of the engine. The exhibit included both the original models suitable for

various makes of cars, and a new model with the pulley at the rear instead of in front of the fan blades.

**Atwater Kent Manufacturing Works.**

**Philadelphia, Penn.**—The main portion of the display was given over to the Atwater Kent Unispark ignition systems, first placed on the market in 1905. Particular attention was drawn to the new type K-2, which is practically the same as the older types, with the exception of the hard rubber casing and cap. This will be supplied to the manufacturer only, and has already been adopted as regular equipment on a number of cars. Another feature of the exhibit was the Monoplex horn, designed for operation on dry cells, storage battery or charging dynamo of from six to nine volts. This is made in two types, with short and long projector.

**New York Coil Company.**

**New York City**—Demonstration was made of the various Ford accessories produced by this concern, one illustrating the ease with which the Nyco accelerator and power adder is operated to enrich the supply of fuel. Other products to which special attention was directed were the Nyco two-system switch, designed to permit the operation of the Ford on the master vibrator or vibrating coils, thus furnishing two systems, and the Rhoades' unit spark system, complete with necessary fittings.

**New York & New Jersey Lubricant Company.**

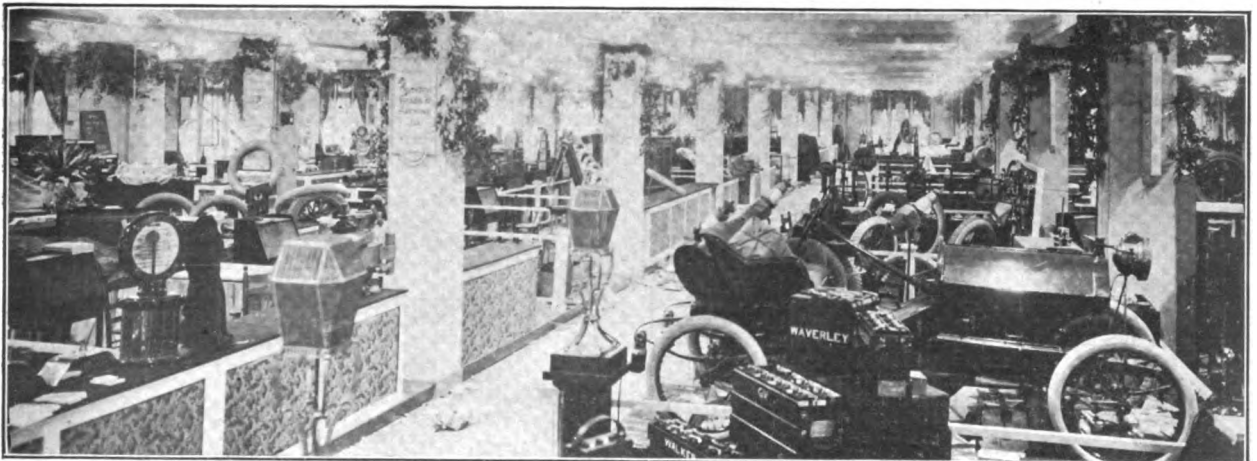
**New York City**—Special attention was directed to the sprocket wheel trade mark on packages containing Non-Fluid oil made by this concern. The attendants were kept busy explaining the difference between these lubricants and other so-called non-fluid oils, and it was made clear that this company was originator of the term as applied to automobile lubricants. The packages were well arranged, and the lighting effects were such as to direct attention to the exhibit.

**Marburg Bros.**

**New York City**—The concern is an importer of the Mea magneto, S. R. O. ball bearings and other products. A distinctive feature of the Mea instrument lies in the rocking of the magnets, and there is no departure from this principle in the new water proof types, although the housing remains stationary, and the bell shaped magnets are shifted around the armature, together with the timing mechanism. The company also displayed the Lucifer motorcycle lighting outfit, brought out during the New York show in 1913.

**Chas. E. Miller.**

**New York City**—The importance of this concern as the pioneer accessory house in America is such that it handles practically every known product of merit in its 15 stores in 12 cities and nine states. As has been its custom for a number of years, handsome, large catalogues of the goods handled by it were distributed to all visitors. Special attention was directed to the Miller spark plugs, these being sold at a very low price during the show, and to Miller's Pan-American oils.



Looking Down the Centre Aisle Among the Accessory Exhibitors on the Fourth Floor.



**A. R. Mosler & Co.**

**Mount Vernon, N. Y.**—Owing to the recent decision respecting the so-called Canfield patent, attendants at this booth were prepared to explain its bearing upon the spark plug industry. The display included a very complete line of Mosler Splitfire plugs, made in different styles to meet the requirements of individual motors, Vesuvius and Superior plugs, and the new priming plug. The Mosler step mat also occupied a prominent place in the exhibit.

**Motometer Company.**

**New York City.**—The exhibit was devoted to the Boyce Motometer, a device provided with a special type of thermometer or meter in which is a red fluid. The dial is calibrated and the fluid rises and falls according to the temperature of the water in the radiator, to which the instrument is fitted. The device is made in two sizes, one of which is designed particularly for application to Ford cars.

**Perfection Spring Company.**

**Cleveland, O.**—The full line of Krupp steel vehicle springs, made by this concern for both pleasure and commercial cars, was arranged so as to display the very efficient qualities of the product. Special constructions are offered to meet the individual requirements of the manufacturer, this applying particularly to the maker of motor trucks and business wagons.

**Philadelphia Storage Battery Company.**

**Philadelphia, Penn.**—The display at this booth included specimens of completely assembled trays of cells to represent units that are installed in each of the makes of electric trucks and pleasure cars on the American market. Batteries of types designed for ignition, lighting and starting also were shown, these being arranged to indicate the method of construction. Particular attention was called to the diamond grid feature of these batteries.

**Pyrene Manufacturing Company.**

**New York City.**—Special attention was directed to the non-conductivity of Pyrene mixture used in the fire extinguishers made by this company, and therefore to the absence of danger in employing the extinguisher for fighting fires on electric vehicles or in the vicinity of electrical apparatus. The company is also producing a neat bracket for the container, so finished as to harmonize with the other fittings of the car. Another addition to the line is an emergency fire hood, designed to be slipped over the head when it becomes necessary to enter a burning building or approach closely to a fire.

**Randall-Faichney Company.**

**Boston, Mass.**—Emphasis was laid upon the construction of the Blitz spark plugs made by this concern, a large part of the display being devoted to this line. Other standard products of the company included the line of Jericho and Jubilee horns, for both automobiles and motorcycles, the B-line grease guns, etc.

**Remy Electric Company.**

**Anderson, Ind.**—The display included a full line of the well known Remy magnetos, as well as the new Remy starting and lighting equipments, described in detail elsewhere in this issue.

**Rhineland Machine Works Company.**

**New York City.**—A full line of the ball bearings made by this concern was on display, including the self-aligning bearings, and demonstrations were arranged to indicate the various uses to which they are applicable. Attention also was drawn to the A. V. shock absorber, made abroad and represented in this country by the Hudson Export & Import Company. Still another portion of the display was given over to Anchor spark plugs.

**Royal Equipment Company.**

**Bridgeport, Conn.**—A large portion of this booth was devoted to the presentation of a loom for weaving Raybestos brake lining. This proved a most interesting demonstration and one which gave the visitor a very clear idea of the manner in which the material is produced. The display also included the line of Duplex brakes made by this company, and a new Ford special brake and lining, the latter being without the use of metal.

**J. H. Sager Company.**

**Rochester, N. Y.**—Demonstration was made of the new J. H. S. shock absorbers for Ford and other cars.

The construction is a combination of a piston working within a cylinder and coiled springs, and they are made in two types, single and twin-cylinder. The older type of Sager equalizing springs also was shown, and the display included the full line of Diamond, Protection, Universal and Simplex bumpers.

**Splitdorf Electrical Company.**

**Newark, N. J.**—The new Splitdorf Ford outfit occupied the central space in the exhibit of this concern, this being designed to supply a true high-tension magneto equipment for model T Ford machines. The display also included a full line of Splitdorf magnetos, transformers, plugs, electric lighting and starting outfits, etc. Another new product is the water proof motorcycle magneto, designed for one, two and four-cylinder machines.

**Springfield Metal Body Company.**

**Springfield, Mass.**—Two of the convertible body designs made by this company were shown at this booth. One was for seven passengers, this being upholstered in light gray cloth and painted the same shade of gray. The other was a three-passenger roadster model, with collapsible rumble seat of new design. An attendant explained the features of construction, and the neat appearance of the two bodies shown met with decided approval.

**Standard Woven Fabric Company.**

**Framingham, Mass.**—The particular merits of Multi-bestos brake lining materials were called to the attention of the visitors, and a special feature of the exhibit was a testing machine, such as is utilized at the factory. This was in the form of a friction transmission, the various belts, friction facings, etc., being composed of Multi-bestos material. The object was to demonstrate the effectiveness of the product under differing conditions of service. Among the new things shown at this booth were the Ford special brake lining and a series of Multi-bestos fan belts for Ford cars and other machines.

**Stewart-Warner Speedometer Corporation.**

**Chicago, Ill.**—A full line of Stewart and Warner speedometers was supplemented this year by the addition of the Stewart one-cylinder air pump, the new Stewart motorcycle speedometer, Stewart hub odometers and other lines. Particular attention was directed to the Stewart thermo-automatic carburetor adjuster, in which the expansion and contraction of mercury in a bulb emerged in the cooling system operates an adjusting screw attached to the carburetor. Another feature of the display was the Stewart speedometer for cream separators, as indicating the influence of automobile accessories on other industries.

**Vacuum Oil Company.**

**Rochester, N. Y.**—The display made by this company was a duplicate of that made at the recent Paris Automobile Salon, the booth being reproduced exactly, except for the substitution of English for French in the signs and literature. The product of the company, Vacuum Mobiloils, is well known among motorists, and it has a wide use throughout the entire world.

**Valentine & Co.**

**New York City.**—Valentine varnishes were displayed in their original packages, and special attention was directed to Vanadium Chassis Finishing in a particularly interesting demonstration. A wheel emerged in soapy water was with six of its spokes finished in automobile varnishes made by other concerns, and six with the above named product. This was for the purpose of indicating that the latter is absolutely unharmed by the caustic action of soap.

**Veeder Manufacturing Company.**

**Hartford, Conn.**—Special attention was directed to the new form K Veeder hub odometer for motor trucks, etc. The principle does not differ from that of previous designs, but the face is provided with five dials indicating miles, and one for tenths. The instrument is somewhat more compact than its predecessors. The company also displayed its line of odometers, tachometers, mileage recorders, etc.

**Weed Chain Tire Grip Company.**

**Bridgeport, Conn.**—A noticeable feature of this exhibit was the addition of the Lyon solid tire grips for commercial vehicles, recently acquired by this concern. Of course the major portion of the display was given over to the well known Weed chain for pleasure vehicles. These are also made in similar types for motorcycle and



motor truck use. The only change in this line is in the commercial vehicle type, in which electrically welded side chains have replaced the older design.

West Side Y. M. C. A.

New York City—A special booth was placed at the disposal of this institution in order that it might call attention to the courses of instruction followed in its automobile school. Aside from the literature regarding these, cut-out motors and other mechanical constructions utilized in the school were presented to indicate

the thorough manner in which the subjects are treated.

Willard Storage Battery Company.

Cleveland, O.—The display included a full line of the well known LBA storage batteries for vehicle service, with special emphasis upon those designed for lighting and starting systems. One of the new features was the six-volt motorcycle battery of 15 ampere-hours capacity, this being produced in two types, one in a rubber case and the other in wood. Both are light and exceedingly well adapted for use on the two-wheel mount.

## ENGINEERS' MEETING.

### Annual Gathering in New York City—Election of Officers for Ensuing Year.

The annual meeting of the Society of Automobile Engineers was held at the rooms of the Automobile Club of America, New York City, Jan. 6-8, at which the following officers were elected for the ensuing year: President, Henry M. Leland, Cadillac Motor Car Company, Detroit; vice presidents, William Guy Wall, National Motor Vehicle Company, Indianapolis, Ind., and K. W. Zimmerschied, General Motors Company, Detroit; treasurer, Henry F. Cuntz, New York City; members of the council for two years, Christian Girl, Perfection Spring Company, Cleveland, O., and Henry W. Wilson.

The various sessions were devoted to the reading of papers and discussions thereon, and to reports from various committees. Among the papers read were the following: "Storage Batteries", W. H. Conant, Gould Storage Battery Company, New York City; "Necessity for More Special Data for Electric Car Designers", W. J. B. Thomas, Century Electric Car Company, Chicago; "Automobile Efficiency", David L. Gallup, Worcester Polytechnic Institute, Worcester, Mass.; "Final Drive for Motor Trucks", Arthur J. Slade, New York City; "Internal Gear", V. V. Torbensen, Newark, N. J.; "Double-Reduction Live Axle", B. B. Bachman, Philadelphia, Penn.; "Worm Gear", John Younger, Buffalo, N. Y.; "Chain", H. D. Church, Detroit; "Gasoline Locomotives for Mines", J. A. Anglada, New York City; "Development of Electric Tractor for Handling Freight Cars Over Tracks Laid on City Streets", T. V. Buckwalter, Altoona, Penn.; "Taxicab Specifications", L. P. Prossen, New York City; "Radiators", J. W. Cain, Detroit; "Workshop Organization", Charles G. Renold, and "Notes on Scientific Shop Management", Henry W. Allingham.

The annual dinner of the organization took place at the Hotel Plaza, and a large number of members and guests were present. The meetings were in charge of a committee composed of Arthur B. Cumner, E. T. Birdsall, J. G. Perkin,

Howard E. Coffin, Christian Girl and Coker F. Clarkson. The banquet committee was as follows: Howard Marmon, Arthur B. Cumner, J. A. Arnold, Allen L. McMurtry, H. M. Swetland, R. M. Lloyd and Coker F. Clarkson.

## COMING EVENTS.

### January.

Jan. 10-17—Show, Philadelphia, Penn.  
Jan. 10-21—Show, Brussels, Belgium.  
Jan. 12-17—Show, Bridgeport, Conn.  
Jan. 14-21—Maritime motor show, St. John, N. B.  
Jan. 17-24—Show, Pittsburgh, Penn.  
Jan. 17-24—Show, Detroit, Mich.  
Jan. 19-24—Show, Washington, D. C.  
Jan. 20-24—Show, Baltimore, Md.  
Jan. 24-31—Pleasure car show, Montreal, Que.  
Jan. 24-31—Show, Rochester, N. Y.  
Jan. 24-31—Pleasure car show, Coliseum, Chicago, Ill.  
Jan. 26-31—Show, Scranton, Penn.  
Jan. 31-Feb. 7—Show, Minneapolis, Minn.

### February.

Feb. 2-7—Show, Troy, N. Y.  
Feb. 2-7—Pleasure car show, Buffalo, N. Y.  
Feb. 3-7—Show, Kalamazoo, Mich.  
Feb. 3-7—Commercial car show, Montreal, Que.  
Feb. 4-7—Show, St. Joseph, Mo.  
Feb. 7-12—Show, Seattle, Wash.  
Feb. 9-14—Truck show, Buffalo, N. Y.  
Feb. 9-14—Show, Grand Rapids, Mich.  
Feb. 11-14—Show, Louisville, Ky.  
Feb. 11-14—Show, Geneva, N. Y.  
Feb. 14-21—Show, Pittsburgh, Penn.  
Feb. 16-21—Canadian national show, Toronto, Ont.  
Feb. 16-21—Show, Kansas City, Mo.  
Feb. 18-21—Show, Bloomington, Ill.  
Feb. 21—Vanderbilt Cup race, Santa Monica, Cal.  
Feb. 21-28—Show, Hartford, Conn.  
Feb. 21-28—Show, First Regiment Armory, Newark, N. J.  
Feb. 21-28—Pleasure car show, Cincinnati, O.  
Feb. 23-28—Show, Omaha, Neb.  
Feb. 24-28—Show, Syracuse, N. Y.  
Feb. 28—Grand Prize Race, Santa Monica, Cal.

### March.

March 2-4—Commercial car show, Cincinnati, O.  
March 2-6—Show, Fort Dodge, Ia.  
March 4-7—Show, Tiffin, O.  
March 7-14—Pleasure car show, Mechanics' Building, Boston, Mass.  
March 9-14—Show, Des Moines, Ia.  
March 17-21—Truck show, Mechanics' Building, Boston, Mass.

### April.

April 9-15—Show, Manchester, N. H.

### May.

May 24-25—Targa Florio race, Italy.  
May 30—500-mile race, Indianapolis, Ind.

### June.

June 9-11—Isle of Man road race.

### July.

July 3-4—Road races, Tacoma, Wash.  
July 4—Grand Prix, Lyons, France.  
July 25-29—Grand Prix race, Belgium.

### August.

Aug. 28-29—Road races, Elgin, Ill.

### September.

Sept. 9—Road race, Corona, Cal.  
Sept. 9—Grand Prix, Italy.



## IN THE REALM OF THE MOTORCYCLIST.

### Review of the Machines and Accessories Display at the New York Show--British Mounts Share Honors with Those of American Make---Results at Savannah.

**U**NDoubtedly the most interesting feature of the motorcycle section of the New York show, insofar as American machines were concerned—for this year there were two makes of foreign mounts on display—was the announcement of a complete electric lighting system by the Miami Cycle & Manufacturing Company, Middletown, O., on its seven horsepower Flying Merkel twin. It hardly was expected that innovations of this character would be presented at this exhibition, since the national motorcycle show in Chicago, in November, had been considered by the riders and dealers as the one big event of the year for that portion of the industry.

Twelve manufacturers of two-wheel mounts exhibited direct on the fourth floor of the Grand Central Palace, as against 23 at Chicago, and all of these had previously made display at the November show. However, the number of makes on display was increased to 15, if the machines exhibited at some of the accessory booths be added in the count.

#### Machines on Display.

The 12 manufacturers were: Davis Sewing Machine Company, Dayton, O., Dayton; Emblem Manufacturing Company, Angola, N. Y., Emblem; Excelsior Motor Manufacturing & Supply Company, Chicago, Ill., Excelsior; Miami Cycle & Manufacturing Company, Middletown, O., Flying Merkel; Harley-Davidson Motor Company, Milwaukee, Wis., Harley-Davidson; Henderson Motorcycle Company, Detroit, Henderson; Hendee Manufacturing Company, Springfield, Mass., Indian; Pope Manufacturing Company, Hartford, Conn., Pope; Reading-Standard

Company, Reading, Penn., R-S; Schickel Motor Company, Stamford, Conn., Schickel; Aurora Automatic Machinery Company, Chicago, Ill., Thor; Consolidated Manufacturing Company, Toledo, O., Yale. Peter A. Frasse & Co., New York City, exhibited the Rudge, and Herbert F. L. Funke & Co., New York City, the Scott, both British made machines, while the Pierce, made by the Pierce Cycle Company, Buffalo, N. Y., was shown at the booth of F. A. Baker & Co., New York City.

#### Few Changes Noted.

All of the American machines, including the Pierce, were shown at Chicago, and it may be added that those displayed in New York presented little change from the announcements made in November, with the exception of the Dayton, Pope and Flying Merkel. With the first two practically the only alteration is in the matter of fitting a two-speed gear. The Pope



General View of the Motorcycle Section of the New York Show, Flying Merkel Exhibit in the Foreground.

model was not shown during the opening days of the exhibition, but was announced and was expected to arrive before the close. The Dayton two-speed was on display. It also was announced that the maker of the Emblem had arranged to fit any of its models with either an Eclipse or Thor gear at extra cost.

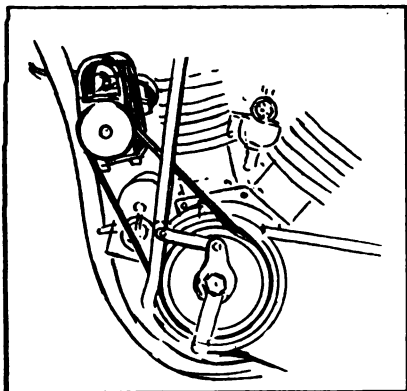
#### Dayton and Pope.

The Dayton is produced in two models, both twins, one of seven horsepower and the other of nine. The two-speed gear is fitted to each. The drive is similar to the ordinary countershaft drive utilized on the regular models, and the gearcase is neatly stowed away just under the tool kit, so that the general appearance of the



machine at the first glance is unchanged.

The Pope drive is of the double-step chain type with the short chain in the usual location.



**Vesta Lighting Equipment on Flying Merkel.**

The long drive chain, however, is fitted on the right side, the sprockets being attached to both ends of the countershaft. The gearset is of the always-in-mesh type, and is fitted with large diameter gears of large pitch and exceptionally wide face. On high speed the gears carry no load, the drive being direct through the countershaft, which is carried on large annular ball bearings. The change to low speed is made by shifting a dog clutch, also of ample proportions, and the drive is either 6:1 or 7:1, at the option of the purchaser.

#### **Merkel's Lighting Generator.**

The electric lighting system supplied with the seven horsepower Flying Merkel twin of the regular type, is the Vesta, the product of the Vesta Accumulator Company, Chicago, Ill. The generator is of the shuttle armature, permanent field type, and is belt driven directly from the crankshaft of the motor through the intermediary of a pair of pulleys so related as to diameters that the armature revolves at about 2.5:1. The generator develops but two volts at ordinary speeds, and this is cited as an advantage, permitting the use of batteries of small size and weight.

The dynamo is clamped in a permanent manner to the front tube of the frame, so that it is positioned just above the magneto. The battery is carried in a small metal case on the right side of the machine immediately below the saddle, and the wires leading from the dynamo to the battery and to the head and tail lights are suitably encased against the action of the weather. The headlight is of the standard torpedo type with parabolic reflector, and the tail light is a miniature aluminum device of neat design.

#### **Two British Machines.**

Considerable interest was manifested in the two British machines, although they were not exhibited for the purpose of introducing them in the American market, but in connection, in each

instance, with a display of British made chains. The Rudge presents a very attractive appearance, but from the viewpoint of an American rider, it is plentifully supplied with controls of one kind or another, and thus conveys the impression of being complicated. The Scott is fitted with a two-cylinder, two-cycle, water-cooled, vertical motor, and was of interest because of the innovation of this combination of features.

#### **Accessory Exhibitors.**

A large number of accessory concerns laid special emphasis upon fittings designed for motorcycles, and it was noticeable that the list of motorcycle accessory jobbers was somewhat larger this year than heretofore at a New York show. Many of these devices were displayed in connection with those made by the same concern for automobile service, and as a result the visitor who was interested solely in motorcycles probably failed to grasp the opportunity for examining them.

#### **Several New Lamps.**

The tendency toward the adoption of electric lighting systems was reflected in the number of headlights displayed. Several of these were with some means for meeting the requirements of ordinances prohibiting the use of glaring lights

**THE FLYING MERKEL**

**FOR 1914**

#### **MODELS AND PRICES**

|  |                 |
|--|-----------------|
| <b>Model 440—4 H. P., Belt Drive, Single Cylinder,</b>         | <b>\$210.00</b> |
| <b>Model 441—4 H. P., Chain Drive, Single Cylinder,</b>        | <b>210.00</b>   |
| <b>Model 470—7 H. P., Belt Drive, Twin Cylinder,</b>           | <b>225.00</b>   |
| <b>Model 471—7 H. P., Chain Drive, Twin Cylinder,</b>          | <b>225.00</b>   |
| <b>Model 473—7 H. P., Self-Starting "Yellow Jacket" Model,</b> | <b>290.00</b>   |

**IMMEDIATE DELIVERIES OF GENUINE  
GUARANTEED 1914 MODELS IN CAR-  
LOAD LOTS OR LESS.**

**Wire For Territory Today**

**THE MIAMI CYCLE & MFG. CO.**

**320 Hanover Street MIDDLETOWN, OHIO, U. S. A.**

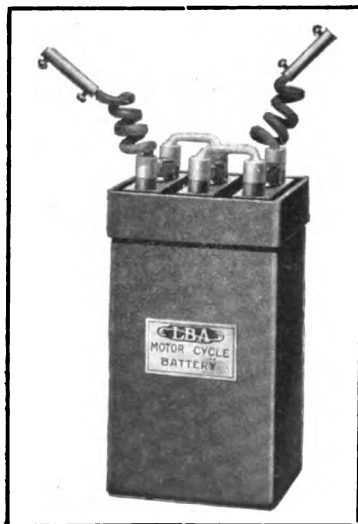
**New England Branch  
315 Dwight Street Springfield, Mass.**



within the city limits. This was particularly true of the Glareless lamp, made by the Roffy-Grace Corporation, New York City; the Solar double-bulb type, made by the Badger Brass Manufacturing Company, Kenosha, Wis., and the new motorcycle lamp made by Gray & Davis, Boston, Mass. Others who displayed lamps were: Hawthorne Manufacturing Company, Bridgeport, Conn., Old Sol; H. W. Johns-Manville Company, New York City, J-M Mobilite; C. & A. Matisse, New York City, Gold Mangin, and B. & L. Auto Lamp Company, New York City.

#### Storage Batteries.

The importance of electric lighting systems for motorcycles has encouraged the production of special batteries, special reference being made herein to those shown by the Philadelphia Storage Battery Company, Philadelphia, Penn., and



One of the New LBA Motorcycle Batteries.

the Willard Storage Battery Company, Cleveland, O. The former concern is marketing two types, in one of which the two cells measure 1.75 by 4.75 by 2.25 inches. The other is a single-cell battery, measuring 1.625 by 3.375 inches and stands 8.25 inches high. The latter is designed for use in connection with a six-volt lighting system, three cells being connected in series, and has

capacity of 40 ampere-hours. The former has a voltage of two a cell and will carry its ampere load for eight hours.

The LBA motorcycle storage battery, made by the Willard Storage Battery Company, is of the six-volt type and is marketed either in a hard rubber or wood case. Both are light in weight and securely sealed against the introduction of foreign matter. The capacity is 15 ampere-hours, and it is maintained by the company that the battery has all the qualities which have made the LBA line such a distinct success in the automobile field.

#### Lucifer Lighting Equipment.

Of particular interest, in connection with electric lighting systems, was the Marburg-Lucifer equipment, shown by Marburg Bros., Inc., New

York City. This has been improved and refined, and the dynamo is held to be similar in construction to the Mea magneto imported by this concern. A bell shaped magneto is employed, the armature being mounted in the axis thereof. The generator is supported in a bracket and so mounted that it can swing into and out of engagement with the motorcycle wheel. This motion is controlled by a small set screw opposing the action of a spring. When the set screw is released the spring presses the dynamo toward the wheel so that the friction wheel on the armature shaft comes in contact with the tire. In this position the dynamo generates current for lighting the lamp when the machine is being operated. For daylight running, the dynamo is held out of contact by the set screw device. The weight is but two pounds, and it is held that the contact of the friction wheel is so nicely regulated that the tire is not in any way injured.

#### Many Carburetors Shown.

Several new carburetors were shown, the Newcomb, made by the Holtzer-Cabot Electric Company, Brookline, Mass., being particularly interesting. This has been made for some time in the automobile types, but this was its first appearance in this field. A floating cylinder, controlled by the action of the motor, serves to open the air inlet and at the same time to admit gasoline through the jet. Since the air inlet ports and the gasoline inlet valve are specially designed and are opened by the floating cylinder, it is maintained that the amount of gasoline and air admitted is always in correct proportion. The Newcomb is made of aluminum, and is provided with a special air horn for any make of machine.

Among the other makes of carburetors shown were: The Sunderman, made by the Sunderman Safety Carburetor Company, Newburg, N. Y.; the Breeze, made by the Breeze Carburetor Company, Newark, N. J., and the B. & B., an English make. The last named is typically British and is made with either one or two-lever control. In the single type, the gasoline jet aperture is automatically controlled, but in the other it is regulated by means of a second lever on the handlebar.

#### Horns and Other Lines.

Horns were displayed by a number of makers, these including: H. W. Johns-Manville Company, New York, Long; Automobile Supply Manufacturing Company, Brooklyn, N. Y., Motophone; Fitzgerald Manufacturing Company, Torrington, Conn., Clero; Electric Spark Appliance Company, Brooklyn, N. Y., Olympic; Dean Electric Company, Elyria, O., Maxo; Sireno Company,



New York City, Cyclephone; Randall-Faichney Company, Boston, Mass., Jubilee.

The Stewart-Warner Speedometer Corporation, Chicago, demonstrated its new motorcycle speedometer, and the H. W. Johns-Manville Company, the Jones, both of which have been described fully in these columns. Other exhibitors to which special attention may be called were: Braender Rubber & Tire Company, Braender tires; Brown Company, Syracuse, N. Y., pumps and lamp hoods; Eclipse Machine Company, Elmira, N. Y., Eclipse clutches and Morrow coaster brakes; Herz & Co., magnetos and ignition devices; Majestic Manufacturing Company, Worcester, Mass., Majestic sidecars; Splitdorf Electrical Company, Newark, N. J., magnetos; Weed Chain Tire Grip Company, Weed chains. Still other exhibitors showed standard lines applicable to both motorcycles and automobiles, and these are covered elsewhere in this issue.

#### Savannah Grand Prize.

Complete details concerning the running of the 300-mile Grand Prize race at Savannah, Ga., Dec. 27, show that Robert Perry of Urbana, Ill., finished in first place on an Excelsior, Maldwyn Jones of Middletown, O., was second on a Flying Merkel, and F. H. Camplejohn of Jacksonville, Fla., was third on a Thor. There were 36 starters, 18 mounted on Indians, eight on Excelsiors, five on Thors, two on Flying Merckels, two on Yales and one on a special. Six of these finished and six others were running when the race was called. The standing at the finish follows:

| Rider and Mount—                  | Time    |
|-----------------------------------|---------|
| Robert Perry, Excelsior.....      | 5:22:08 |
| Maldwyn Jones, Flying Merkel..... | 5:33:03 |
| F. H. Camplejohn, Thor.....       | 5:45:25 |
| J. Yerkes, Thor.....              | 6:08:36 |
| Harry Glynn, Indian.....          | 6:11:58 |
| Rex E. Edmunds, Indian.....       | 6:12:35 |
| Paul Warner, Indian.....          | running |
| J. W. Gregorie, Excelsior.....    | running |
| J. Wilcox, Indian.....            | running |
| Thomas W. Dedge, Indian.....      | running |
| Frank B. Hart, Indian.....        | running |
| J. U. Constant, Indian.....       | running |

#### Latest Merkel News.

The Miami Cycle & Manufacturing Company, Middletown, O., maker of Flying Merkel machines, celebrated its 20th anniversary Dec. 29. There are very few concerns in the industry that have continued in the same line of business for so long a period and the company naturally feels very proud of its birthday.

C. A. Van Doren, who handled the Flying Merkel in Atlantic City, N. J., before assuming the position of New England branch manager, has disposed of his business in that city and has assumed his new duties in Springfield, Mass. He

has closed the following agencies: Matthew Lamberg, Bridgeport, Conn.; C. P. Maley & Co., New Haven; Waterbury Cycle Works, Waterbury; United Cycle Company, Hartford; George Seavey, Haverhill, Mass.; J. E. Farland, Lawrence; J. William Newton, Fall River; F. N. Coleman, Springfield; C. S. Cobb, Plainville; William F. McCarty, Nashua, N. H., and Combination Ladder Company, Providence, R. I.

#### Bosch Also Won.

Another feature of the Savannah race lies in the fact that every machine which finished was equipped with a Bosch magneto, and this is particularly interesting to the Bosch Magneto Company, New York City. The Grand Prize was the fourth long distance event of the year in which this make of ignition equipment has figured thus prominently, the others being the Tourist Trophy race in England, the Elgin National road race and the San Diego-Phoenix road race.

#### New Members in December.

Secretary-Treasurer G. B. Gibson of the Federation of American Motorcyclists reports an addition of 158 new members during the month of December, divided according to states as follows:

California, 27; Iowa, 25; New York, 16; Ohio, 13; Illinois, 11; Georgia, seven; Florida, six; Kansas, six; Arizona, six; Massachusetts, six; Maryland, five; New Jersey, five; Pennsylvania, four; Wisconsin, four; New Hampshire, four; Virginia, two; West Virginia, two; Michigan, two; Oregon, two; Tennessee, Missouri, South Dakota, Nebraska and Utah, one each.

#### Amendment Is Carried.

Secretary Gibson also reports that 78 of the 155 members of the last national assembly of the Federation of American Motorcyclists have voted by mail in favor of the proposed amendment to the constitution, fixing the date for the annual assembly, which reads as follows:

There shall be held between June 15th and Sept. 15th of each year a national assembly of the F. A. M. at such place and time as the board of directors may decide upon; not less than 90 days' notice of such meeting and the hour and place at which it is to be held shall be given.

#### JOIN THE F. A. M.

which is the National Organization fostering the interests of motorcyclists along legislative and other lines. Cut this out, mail it, and you will get the reasons.

#### E. M. ESTABROOK

Chairman Membership Committee Federation  
American Motorcyclists,  
BANGOR, MAINE.

Please send me the F. A. M. Booklet and all information interesting to prospective members.

Name.....

Address.....



## ACCESSORY MANUFACTURERS.

### Officers Elected at the Eleventh Annual Meeting in New York City.

The 11th annual meeting of the Motor & Accessory Manufacturers was held at the Waldorf-Astoria in New York City, Jan. 7, at which there was a very representative attendance of members. The following concerns were admitted to membership: Gouder, Paeschke & Frey Company, Milwaukee, Wis., maker of automobile parts; American Sheet & Tin Plate Company, Pittsburg, Penn., maker of sheet iron, tin plate, etc., and Champion Machine & Forging Company, Cleveland, O., maker of machinery and steam hammer forgings.

The following were re-elected directors for three years: J. H. Foster, Hydraulic Pressed Steel Company; H. E. Raymond, B. F. Goodrich Company; T. J. Wetzel, Spicer Manufacturing Company, and C. W. Stiger, Stromberg Motor Devices Company. The election of officers by the board of directors resulted as follows: President, J. H. Foster, Hydraulic Pressed Steel Company; first vice president, F. Hallett Lovell, Jr., Lovell-McConnell Manufacturing Company; second vice president, C. E. Whitney, Whitney Manufacturing Company; third vice president, F. C. Billings, Billings & Spencer Company; treasurer, L. M. Wainwright, Diamond Chain & Manufacturing Company; secretary and assistant treasurer, Alfred P. Sloan, Jr., Hyatt Roller Bearing Company; manager, William M. Sweet.

### PHILADELPHIA SHOW NEXT.

#### Fifty Dealers in Cars Will Make Display in New Metropolitan Building.

Following immediately upon the close of the New York show, or, to be more exact, opening some few hours before the actual close of the display in the Metropolis, the annual Philadelphia automobile show will be inaugurated Jan. 10, for one week. In contrast with the exhibitions of recent years, when it has been found necessary to utilize two buildings, this year's display will be held in the new business structure, known as the Metropolitan building, at the corner of Broad and Wallace streets.

The arrangements have been completed by a committee of the Philadelphia Automobile Trades Association, composed of Louis Block of the Ford agency, president and chairman; J. E. Gom-

ery of the Hudson, secretary and treasurer; William P. Herbert of the Chandler agency, E. C. Johnson of the Reo and Premier, and Ralph W. Cook of the Peerless. The building adjoins Philadelphia's Automobile Row, and affords some 40,000 square feet of floor space. The decorative scheme will be particularly pleasing. Those who will display cars are:

V. P. Padula, Abbott-Detroit, Havers; American Auto Company, American; C. A. Haines Company, Baker electric; Buick Motor Company, Buick; Automobile Sales Corporation, Cadillac; Cartercar Motor Company, Cartercar; Chalmers Motor Company, Chalmers; Chandler Motor Car Company, Chandler; Automobile Company of Philadelphia, Cole, Marmon; W. W. Gawthrop, Davis; J. C. Bartlett, Detroit and Argo electrics; Detroit Company of Philadelphia, Detroit; J. H. Shoemaker, Dorris; Fiat Motor Company, Fiat; Ford Motor Company, Ford; Sweeten Auto Company, Franklin; Johnson Motor Car Company, Haynes; Gomery & Schwartz Company, Hudson; Tioga Auto Company, Hupmobile; Jeffery Motor Company, Jeffery; Kissel Motor Car Company, Kissel-Kar; Krit Motor Company, K-R-I-T; Locomobile Company of America, Locomobile; Bigelow-Wiley Company, Lozier, Page; Gibbons-Wetherill Service Company, Maxwell; Mercer Automobile Company, Mercer; Fanning-Paxon Company, Mitchell; Minerva Motors Company, Minerva, Moon; Motor Sales Company, National, Henderson; Oakland Motor Company, Oakland; Seltzer-McGowan Company, Ohio electric; Oldsmobile Company, Oldsmobile; Overland-Marion Company, Overland; Packard Motor Company, Packard; Colonial Motor Company, Partin-Palmer; Peerless Motor Car Company, Peerless; Foss-Hughes Motor Company, Pierce-Arrow; E. C. Johnson Company, Reo, Premier; Regal Sales Corporation, Regal; Thornton-Fuller Company, Simplex, S. G. V.; Stanley Motor Carriage Company, Stanley steam; F. B. Stearns Company, Stearns-Knight; A. G. Spaulding, Stevens-Duryea; Studebaker Corporation, Studebaker; S. Blockson Company, Stutz; Touraine Motor Company, Touraine; Standard Motor Company, Velle; White Company, White; Garford Philadelphia Company, Willys-Knight; Winton Motor Carriage Company, Winton.

### MOTZ TIRE BOOKLET.

Contains Much Valuable Information Regarding This Company's Line.

The Motz Tire & Rubber Company, Akron, O., has issued an attractive booklet, which describes and illustrates the already well known Motz cushion tire. It is said to be one of the most elaborate works of this character ever produced, and tells many reasons why these tires are entitled to special consideration for electrics.

The Motz cushion tire has a dual tread, with perpendicular indentations on the inside of each tread, which are held to be decidedly effective as a preventative against skidding. In addition, the tire is constructed with undercut sides, forming slantwise bridges, which, it is maintained, afford resiliency practically equal to the pneumatic.

This booklet will be distributed to all who make request of the company, and it is especially desired that prospective purchasers shall be informed regarding this feature of tire equipment.



**“American Made for American Trade”**

# **NEW DEPARTURE --BALL BEARINGS--**

**T**HE complete success of New Departure Ball Bearings in meeting the demands of the American car manufacturer for a bearing of quality, capacity, efficiency and durability, is attested by the fact that *two thousand skilled mechanics are operating ten and a half acres of modern machinery, producing ten thousand guaranteed bearings per day.*

May we send you catalog?



**The New Departure Mfg. Co.,** **Bristol, Conn.**  
Western Branch, 1016-17 Ford Bldg., Detroit

When Writing to Advertisers, Please Mention The Automobile Journal.



## NOBBY TREAD TIRES.

### Consistent Demand on the Part of Motorists for All the Year Service.

According to the United States Rubber Company, New York City, when the all rubber non-skid tires were first introduced, both the makers who designed them and the public that used them were under the impression that the chief demand would be either in the spring, when the roads were wet with rain, or in the winter months, when the streets and highways were slippery with sleet and snow. This condition may have held true at the time, but there has been a decided tendency toward the adoption of this type of tread for all the year service.

Officials of the company say that there has been a noticeable falling off in the demand for plain tread tires, since the the public discovered the effective anti-skidding effect of the Nobby tread tire made by it. The reason for this is held to lie in the fact that these tires not only furnish greater safety to the user but, even allowing for their higher initial cost, they are the most economical to use in constant service.

## NO LONGER A MYSTERY.

### Expert Holds There Are Over One Million Magneto in Use on Cars Today.

In the early days of motoring there were many who pronounced the magneto a mystery box, but there has been a decided change in public sentiment with respect to this type of ignition equipment. Alfred H. Bartsch of the Bosch Magneto Company, New York City, estimates that there are over 1,000,000 magneto equipped cars running in America today. He reviews the situation as follows:

Even those who have followed closely the history of the motor car do not always realize the part that the magneto has played in making the engine efficient and reliable. The progress made in speed, efficiency and economy is unthinkingly attributed to general refinement of the engine itself. Advances in refinement have been made, it is true. Much higher powers are being obtained from engines of given dimensions; much smoother running, and better pulling through a wide range of speeds; but when it comes to regularity of performance day by day and month after month, the magneto is scarcely given due credit.

Many motorists found that with a weak mixture the magneto fired regularly and well where battery systems would fail. That this was no unsubstantiated belief has long since been clearly proven. It was in 1907, so far as this country was concerned, that the critical period in magneto history occurred. It was no novelty, but the great majority of car manufacturers and motorists did not trust it fully. They admitted the magneto gave better results on the road than the battery did, but it was an absolute mystery to them, and they felt that it was an apparatus that would fail them at any time, and one they

would be utterly unable to put right, and, therefore, they used it with distrust, and, one might say, never without complete duplicate ignition in a battery system, so that if the (to them) mysterious magneto went wrong, they could come home using the auxiliary battery which they understood so much better. Of course, an entire duplicate system is the safest, but with the present day perfection of some magnetos, failure of such is rare indeed, and an independent magneto of the proper quality is all that is necessary.

In taking up the magneto as a sole method of ignition, motorcyclists were over a year in advance of motorists, and it was largely through the reliability of this form of ignition on the motorcycle, despite the fact that it was all among the mud and dust, which gave confidence to motorists. By the end of 1907 there no longer was any doubt as to the reliability of the magneto, and when the simpler forms, followed by the dual ignition combinations came into use in 1908, the magneto became almost universally used. Four or five years ago there were far more cars on the road with battery ignition than with magneto ignition; but today the position is reversed, as not only the majority have magnetos, but a very large proportion of the old cars have been fitted with them.

It may seem strange, at first thought, as the battery had such a strong hold on the field that the magneto should so quickly have ousted that type of ignition system. However, this is easily explained in three words—absence of trouble. Given a good magneto, it requires practically no attention for thousands of miles other than a drop or two of oil, and after long periods of use it will be firing the engine as well as on the day it started work.

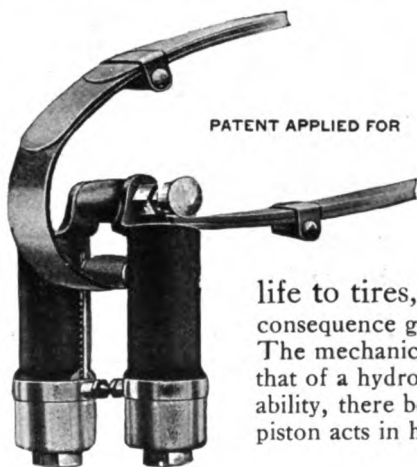
The Albany Automobile Club, Albany, N. Y., has inaugurated a campaign to prevent reckless driving and an intelligent enforcement of the motoring laws. To this end President George G. Lempe, Secretary Roland Ford and Counsel Melvin T. Bender recently held a conference with Chief of Police James L. Hyatt, with a view to establishing an automobile squad, composed of a plain clothes man, a motorcycle policeman and a patrolman on foot, for the purpose of securing sufficient evidence against reckless drivers.

The Heinze Electric Company, Lowell, Mass., announces the opening of a New York sales office and service station at 1876 Broadway, under the management of P. G. Sedley. This branch will carry in stock a complete line of coils and coil parts for Ford cars, carburetors and spark plugs, together with a full line of ignition apparatus. In addition it will be thoroughly equipped for prompt and efficient repair work.

The Toronto automobile show, which will be in the nature of a national event this year, will be held in the Transportation and Horticultural buildings, Feb. 16-21, under the management of E. M. Wilcox, as in the past. The display of pleasure cars will be confined to the former building, while the latter will house the exhibit of motor trucks, motorcycles and accessories. It is expected that the national convention of the newly formed Canadian Automobile Federation will be held during the week of the show.



# J. H. S. SHOCK ABSORBERS



are a revelation as well as a revolution in spring suspension.

Their sensitiveness of action **AUTOMATICALLY** takes up and destroys jars and jolts, either heavy or light, and to the occupant of a car it seems like riding on air—fairly floating through space.

Vibration is eliminated, thus giving long life to tires, motor, transmission and other components. In consequence greater speed is possible, as the car does not tend to skid or roll. The mechanical principle of the J. H. S. Shock Absorber is as scientific as that of a hydro-carbon engine. A cylinder and piston are used to insure durability, there being no fragile parts to wear or easily get out of order. The piston acts in harmony with coiled springs which destroy all shocks.

**PRICE—\$15.00 AND \$25.00 A PAIR**

## ATTRACTIVE OFFER TO FORD OWNERS

**30 DAYS'  
FREE TRIAL**



**ONE YEAR  
GUARANTEE**

## SAGER EQUALIZING SPRINGS

**NINE YEARS OF  
PROVEN SUCCESS**

Endorsed by these prominent manufacturers:  
**Franklin Rambler Saurer Dorris Atterbury Maxwell KisselKar Stoddard-Dayton Stewart**  
**Pope-Hartford Oldsmobile Autocar Elmore Columbia Crawford Logan Lippard-Stewart**

## SAGER QUALITY BUMPERS

Forty models—Channel, Square, 1¼" and 2" Round, Ford Special, clamped on.

**Pierce-Arrow, Packard and Others  
USE SAGER BUMPERS**



**This Channel Bumper  
Designed for Cadillac  
Cars.**



**DIAMOND BUMPER  
Suitable for All Cars**

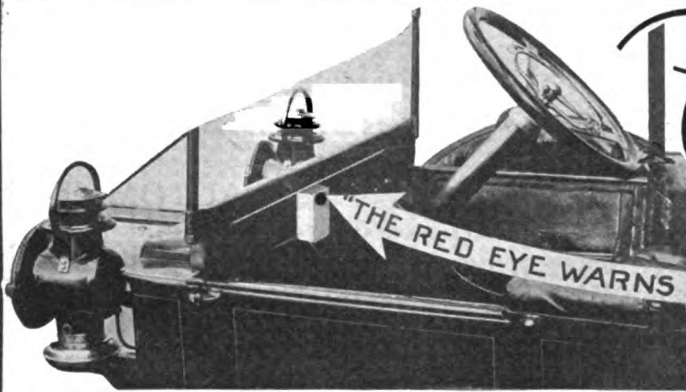
**Prices \$6.50 to \$25.00**

**Liberal Discounts**

**J. H. SAGER COMPANY, 271 South Ave., Rochester, N. Y.**

**When Writing to Advertisers, Please Mention The Automobile Journal.**





# Right on the Dash

"Does away with series wiring and standardizes your lamp equipment"

## The Boston Tail Light Detector

Does what its name indicates, tells you when your rear light fails to work, saving you court fines and court records, as well as provides you with that secure feeling desired by all automobilists.

Easy to attach to all makes of cars, no electrician required. Guaranteed for life of the car.

**PRICE \$5.00** IN ALL FINISHES

**HARDING SPECIALTIES Co. Inc.**

... Manufacturers ...

755 Boylston St. - - - Boston, Mass.

Dealers and Garage Owners will do well to get prices for their respective territories.

Write at once for terms.

# SPLITDORF

"Always There"

The SPLITDORF "T S" TRANSFORMER is interchangeable with any type tube or dash coil and can be attached to any car. We will make a very liberal allowance on an old coil in exchange for one of the new style.

Write TODAY for particulars.

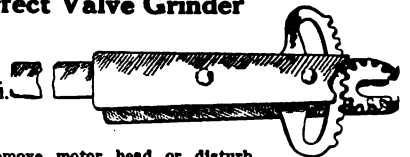
**SPLITDORF ELECTRICAL CO.**

98 Warren Street, Newark, N. J.

**WILL GRIND FORD VALVES**

**Wall's Perfect Valve Grinder**

Patent Pending.  
Patents Allowed.



No need to remove motor head or disturb valve mechanism. A simple, practical tool, that works automatically and any one can operate it. Guaranteed, and will last for years. A new, simple and practical guide for owner, driver and repairer. Keep your valves in perfect condition. Cost of grinder saved first time used. For circulars and price list write

J. H. WALL, 290 Hope Street, BRISTOL, R. I.

Six Cylinder  
65 H. P.  
Equipped  
with Vulcan  
Electric Gear  
Shift

# HAYNES

America's First Car

Four Cylinder  
40 H. P.  
Equipped  
with Vulcan  
Electric Gear  
Shift

Our advertising campaign will send a buyer into your showroom more than half convinced that he should own a Haynes; the sale, however, results only from a successful demonstration; it is our firm belief that, as a Haynes dealer, you possess more than a sufficient number of convincing arguments to make every demonstration result in a quick and profitable sale.

May we tell you why we believe this?

**THE HAYNES AUTOMOBILE COMPANY**  
6 Main St., Kokomo, Indiana.

## THE HEINZE ELECTRIC COMPANY

MANUFACTURERS OF

### Ignition and Generating Apparatus LOWELL, MASS.

Factory and Main Office:  
LOWELL, MASS.

Sales Office:  
DETROIT, MICH.

When Writing to Advertisers, Please Mention The Automobile Journal.



# The "Black Eagle" Spark Plug

PATENTED

## 50 Cents Is Enough

The "Black Eagle" Spark Plug has made good because it was designed and manufactured with this result in view.

A person in close touch with the supply and manufacturing ends of the trade was a visitor at our factory recently, and was shown the details of construction, including the machinery, testing, and assembling of the "BLACK EAGLE" Spark Plug. What he said we believe will be of interest to you, as it indicates the effort on our part to supply a high grade plug at a reasonable price. We therefore quote below his impressions.

"I am simply amazed at the workmanship, material, and construction of the 'BLACK EAGLE' Spark Plug. When I saw this plug advertised at a price of 50c to the consumer, I naturally supposed it was a cheap, common, plug such as you occasionally find in jobbing houses on the bargain counter. I am convinced, after seeing these plugs tested, and examining minutely the machine parts which enter into their construction, that **no better porcelain spark plug is offered by any one, regardless of the price they ask.**"



We are not influenced by what our competitors charge for spark plugs! We have ignored price precedent, for the reason that a high grade spark plug can be manufactured and sold at 50c each, and that is enough.

Sent prepaid on receipt of price. Made in all standard threads.

### THE STANDARD CO.

### Torrington, Conn., U. S. A.



*Mea*  
Magneto

S. R. O. BALL BEARING

MARBURG BROS., Inc.,

Sole Importers

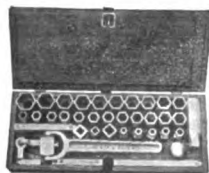
Detroit

1790 Broadway, New York

Chicago

**J. M. Shock Absorber**

Its efficiency is proved by scientific facts—not mere claims. Write for Ovington Data D. to **The J. M. Shock Absorber Co.**, 210 S. 17th Street, Philadelphia. Branches in Boston, Hartford, Providence, and all leading cities



Bay State Autokit, No. 1, \$10

Bay State Autokit, No. 2, \$7.50

Bay State Stickit, \$3

GEO. A. CUTTER, Sales Agent  
Taunton, Mass.



The flakes of carbon fall apart when Carbonox enters the cylinders.

The charred oil, which holds them together and makes them adhere to the metal, is destroyed; they are blown out through the exhaust, leaving the cylinders clean as a whistle.

Practical, efficient, economical, its merit has been tested by thousands of users.

**CARBONOX**  
THE "CHEMICALLY CORRECT" CARBON REMOVER

Belongs to the "Chemically Correct" line, the line that leads to prosperity for a reliable dealer.

Money in it for the seller because merit in it for the buyer.

Write now for catalog and prices.



MAKERS OF

SE-MENT-OL  
FOR RADIATORS  
(FINDS THE LEAK AND FIRES IT)

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For Perfect Control and Safe, Comfortable Driving use

## Weed Anti-Skid Chains

At all Reputable Dealers  
Weed Chain Tire Grip Co., New York

The Easiest Riding  
Car in the  
World

# MARMON

NEW SERIES MARMON "32" F. E. WING MOTOR CAR CO.  
\$2850 to \$4100 "Motor Mart"  
THE MARMON SIX 12 Columbus Ave. BOSTON  
\$5000 to \$6350 New England Dealers for

NORDYKE & MARMON CO., Indianapolis, Ind.

Thoroughly expressive of the  
highest development of auto-  
mobile design, materials and  
construction.

## Mosler Spit Fire

Plugs  
ARE THE BEST  
A.R. MOSLER & CO.  
P.O. BOX "M"  
MT. VERNON, N.Y.

## HAVOLINE

### Automobile Cylinder Oils

INDIAN REFINING CO.  
17 Battery Place New York



### GEISZLER NON-SULPHATING STORAGE BATTERIES

Guaranteed perfect satisfaction or money refunded

SIZE 66 - \$20.00

GEISZLER BROS. STORAGE BATTERY COMPANY  
514 West 57th Street, New York City

## EMPIRE

"The Little Aristocrat"

New Series Model 31

NOW

**\$900**

The Completely Equipped Empire  
five-passenger touring car \$900

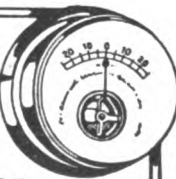
Advance catalogue is ready  
We will send the pictured  
story of the Transcontinental  
Empire on request.

Empire Automobile Co., Indianapolis, U. S. A.

ALWAYS SPECIFY

## HOYT METERS

AND GET YOUR MONEY'S WORTH  
HOYT ELECTRICAL WORKS  
INSTRUMENT  
PENAGOOK, NEW HAMPSHIRE



## Elyria-Dean

Trade Mark

ELECTRICAL APPARATUS OF QUALITY

Tuto (\$15.00) and Rexo (\$8.00) Auto Horns

THE DEAN ELECTRIC COMPANY

2506 Olive St., ELYRIA, O.

TIRE TROUBLES?

YOU CAN'T HAVE THEM WITH

## DAYTON

### Airless Tires

DAYTON RUBBER MFG. CO., 1011 Kiser St., DAYTON, O.

## Studebaker

"Accessibility of the motor a leading feature"  
"25"—\$885 "35"—\$1290 "SIX"—\$1550  
All prices for cars fully equipped F. O. B. Detroit.  
STUDEBAKER, - - - DETROIT, MICH.

## GOOD YEAR

AKRON, OHIO

This name on Automobile Tires and Rubber Accessories  
signifies inherent qualities of material and workmanship that  
insure the maximum of service at the minimum of expense.

THE GOODYEAR TIRE & RUBBER COMPANY, AKRON, OHIO (678)

## HERZ PLUG

"BOUGIE MERCEDES"

### BEST ON EARTH

BLUE STONE AND STEEL HERZ & CO.  
NEW YORK

## COLE

THE  
STANDARDIZED  
CAR



The car that started the stampede to standardization  
A Cole franchise is a valuable asset to any dealer. Find out about it.

Cole Motor Car Co. of Indianapolis



## Apelco

Electric Lighting and Starting Systems for Motor  
Boats.  
Electric Lighting and Starting Systems for  
Automobiles.  
Electric House Lighting Outfits and Golden  
Glow Lamps.

Apelco products are the standard by  
which others are judged.

THE APPLE ELECTRIC COMPANY  
74 Canal Street, Dayton, Ohio

Subscribe to  
**The Motor Truck**

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# Classified Buyers' Guide

## A Handy Reference for Purchasers

### ACCESSORY MANUFACTURERS AND JOBBERS.

**Alsten & Goulding Co.**, 36 Foster St., Worcester, Mass.  
**Auto Parts Co.**, Providence, R. I.

**Hopewell Brothers**, Newton, Mass.

Branch: 1974 Broadway at 67th St., New York.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.

**Müller, Chas. E.**, 97-103 Reade St., New York.

Branches: 202-204 Columbus Ave., Boston; Bridge and Dwight streets, Springfield, Mass.; 274 Trumbull St., Hartford, Conn.; 924 Eighth Ave. and 2782 Broadway, New York; 1421 Bedford Ave., Brooklyn, N. Y.; 818 North Broad St., Philadelphia; 824 Main St., Buffalo, N. Y.; 1829 Euclid Ave., Cleveland; 227 Jefferson St., Detroit; 259 Peachtree St., Atlanta, Ga.; 601-603 Baronne St., New Orleans, La.; 135 Central Ave., Albany, N. Y.; 274 Halsey St., Newark, N. J.

**Milwaukee Auto Specialty Co.**, 128 Second St., Milwaukee, Wis.

**Motor Parts Co.**, 185-187 Columbus Ave., Boston; 818 No. Broad St., Philadelphia; Springfield, Mass.

**Northwestern Chemical Co.**, Marietta, O.

**Waite Auto Supply Co.**, 81 Exchange place, Providence.

### ACETYLENE TANKS. (See Tanks.)

### AIR COMPRESSORS AND TANKS.

**Williams Foundry & Machine Co.**, Akron, O.

### AMMETERS AND VOLTMETERS.

**Hoyt Electrical Instrument Works**, Penacook, N. H.

### AUTOMOBILES. (See Cars.)

### AUTOMOBILE SPECIALTIES.

**Cox Brass Mfg. Co.**, Dudley Ave., Albany, N. Y. (Brass Goods.)

### BALLS AND BALL BEARINGS.

**Boyd, F. Shirley**, 903 Boylston St., Boston. (R. I. V.)

**Hyatt Roller Bearing Co.**, Detroit.

**Marburg Bros., Inc.**, 1790 Broadway, New York. (S. R. O.)

**New Departure Mfg. Co.**, Bristol, Conn.

**Rhineland Machine Works Co.**, 140 W. 42nd St., New York City.

Branches: 1254 Michigan Ave., Chicago, 650 Woodward Ave., Detroit; 1424 Vine St., Philadelphia; 220 Motor Mart, Boston.

**R. I. V. Co.**, 1771 Broadway, New York. (R. I. V.)

### BATTERIES.

**Electric Storage Battery Co.**, Philadelphia. (Exide.)

**Gelsler Bros. Storage Battery Co.**, 514 W. 57th St., New York.




**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City. (J-M.)

**Waite Auto Supply Co.**, 81 Exchange place, Providence. (Success.)

### BATTERY EXTINGUISHERS.

**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City.

(Continued on Next Page.)

|  |  |   |
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| <b>Dover Soap Economizer</b><br><br>Saves over one-third soap consumption | <b>Dover Electric Light Bulb Case</b><br>Safe and Very Compact<br><br>Send for Catalogue | <b>DOVER SAVAL MEASURE AND FUNNEL</b><br><br>With Automatic Shut-Off Prevents Overflowing Oil Tank |
|--|--|---|

**DOVER STAMPING & MFG. CO., Cambridge, Mass.**

**EISEMANN**



The performance of Eisemann Ignition Systems during the Indiana-Pacific Tour justifies every claim we have ever made for Eisemann efficiency and dependability.

**The Eisemann Magneto Company**  
 Sales and General Offices  
 225-227 West 57th St., New York  
 Indianapolis, Ind. 514 North Capitol Ave.  
 Detroit, Mich. 802 Woodward Ave.

The *Pilot* "THE CAR AHEAD"

**THREE GREAT MODELS**

Pilot 50--4 cylinder, 41-2x6--59 H. P., 120 inch wheel base, roadster and touring car--\$2250. Pilot 50--Roadster--4, 6 and 7 passenger bodies, 126 inch wheel base--\$2500. Pilot 60--6 cylinder, 4x6, brake test 67 H. P., 132 inch wheel base roadster--4, 6 and 7 passenger touring cars--\$2785.

**The Car Without a Mechanical Defect**

Teetor "T" head motors, full floating rear axles, Brown-Lipe differential, Warner transmission, Eisemann Magneto, Carter Carburetor, handsome jewel bodies with ventilating windshield. Completely equipped, with every convenience and comfort. Dynamo electric lighting and electric starter (Gray & Davis system), power tire pump. We have the greatest agency proposition in the United States. Write for our beautiful art book showing cars in detail.

**PILOT CAR SALES CO., Richmond, Indiana**

FOUR CYLINDER MODELS

SIX CYLINDER MODELS

THE CAR THAT MADE

**STUTZ**

GOOD IN A DAY

STUTZ MOTOR CAR COMPANY INDIANAPOLIS INDIANA



## (BUYERS' GUIDE—Continued.)

**Jackson** OLYMPIC - \$1500  
4 cylinders

MAJESTIC - \$1975  
4 cylinders

No Hill Too Steep  
No Sand Too Deep

SULTANIC - \$2500  
6 cylinders

JACKSON AUTOMOBILE CO., 1203 East Main St. Jackson, Mich.

**National**  
STOCK CHAMPION

FIVE MODELS Electric Starter Electric Lights \$2750 to \$3400

National Motor Vehicle Co., Indianapolis

THE "SIX-48" KEETON  
REPRESENTS

The "finer points" of EUROPEAN DESIGN

\$3250 Completely Equipped

Interesting literature sent on request

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THE 10% OVERWEIGHT TIRES  
Guaranteed for 4000 Miles Service

Measured by Mileage, the Cheapest Shoes Ever Made.  
Clincher and Quick Detachable, Plain and Break-Skid Treads, Regular and Metric Sizes, for All Standard Rims.

THE CATARACT RUBBER COMPANY  
Boston, New York, Providence. Factory: WOOSTER, O.

For Your Tires' Sake and Your Own, Use The  
**BROWN IMPULSE TIRE PUMP**  
with the  
**B'CO Q. D. SPARK PLUG**

A necessity, not an accessory. Ask your dealer or write us for full particulars.

THE BROWN CO., 222 Bellevue Ave., Syracuse, N. Y.

INSIST ON GETTING  
**Colonial Motor Oil**  
No substitute "just as good"

Borne, Scrymser Company  
NEW YORK BOSTON FALL RIVER PHILADELPHIA

## Cartercar

With the gearless transmission—will give better service than is possible for a gear car. Unlimited speeds—climbs steep hills—gives double the usual tire mileage.

CARTERCAR COMPANY, Pontiac, Mich. Send for catalog

### BODIES—WOOD AND METAL.

Springfield Metal Body Co., 20 Medford Ave., Springfield, Mass.

### BRAKE BANDING OR LINING.

Johns-Manville Co., H. W., Madison Ave. and 41st St., New York City. (J-M Non-Burn.)

Standard Woven Fabric Co., Framingham, Mass. (Multibestos.)

Branches: F. Shirley Boyd, 903 Boylston St., Boston; C. D. Schmidt, 276 Canal St., New York City; N. A. Petry Co., 1427 Vine St., Philadelphia; F. E. Sparks, 1430 Michigan Blvd., Chicago; Fred Ward & Son, San Francisco.

### BRUSHES, WIRE.

Williams Foundry & Machine Co., Akron, O.

### BUMPERS AND FENDERS.

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(Prest-O-Lite.)  
Branches: See Cylinder Cleaning Compound.

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Dayton Rubber Mfg. Co., Dayton, O. (Dayton Airless.)  
Gaulois Tire Corp., 1926 Broadway, New York. (Gaulois.)  
Goodyear Tire & Rubber Co., Madison St., Akron, O. (No-  
Rim-Cut.)

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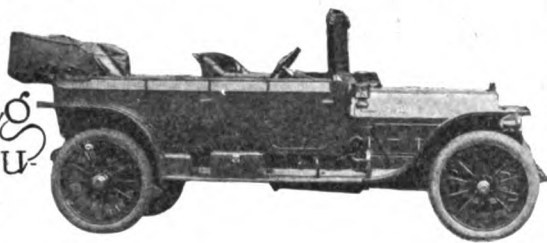
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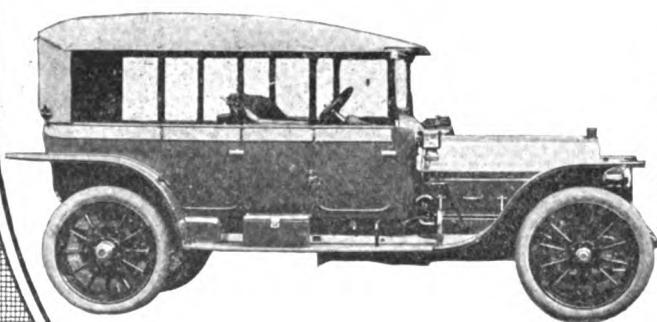


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VOL. XXXVI.

NO. 12.

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PAWTUCKET R.I.

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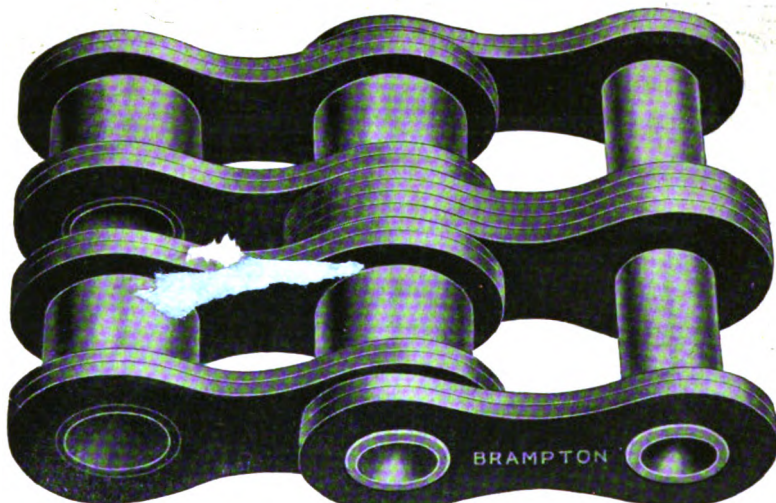
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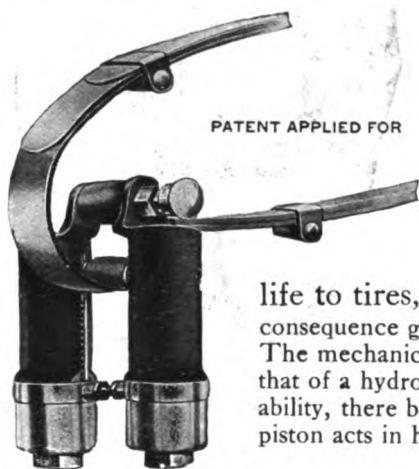
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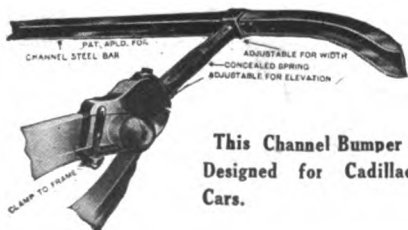
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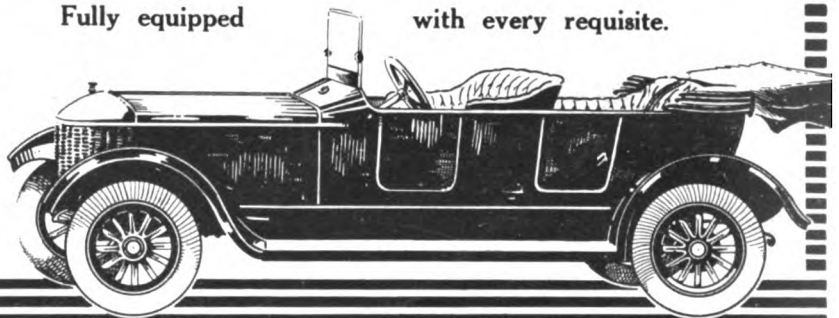
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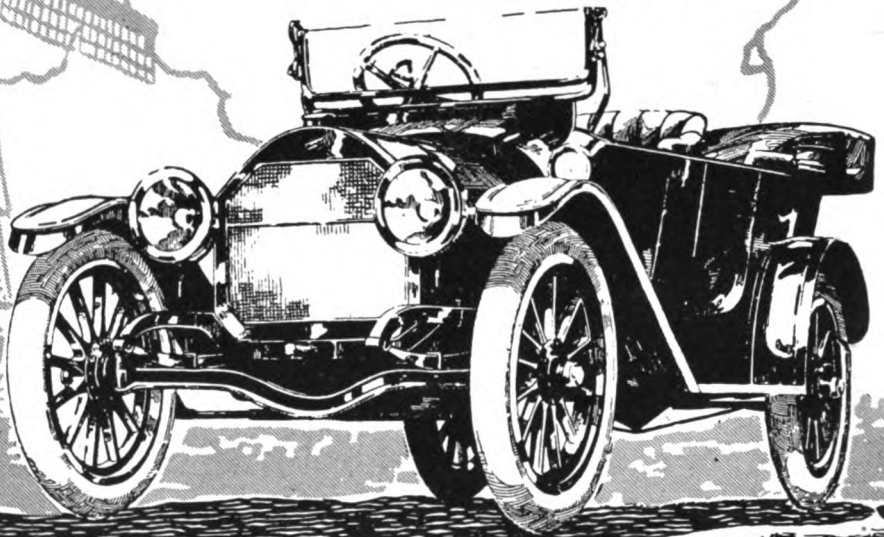
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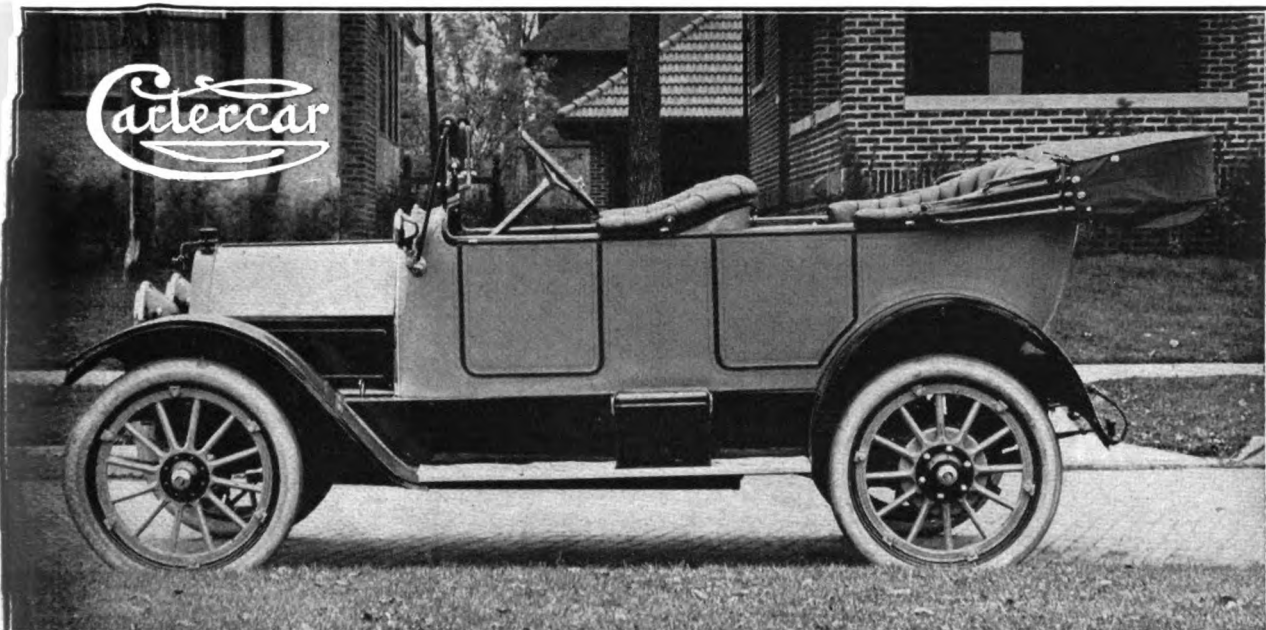
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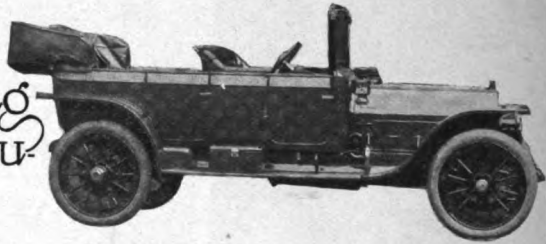
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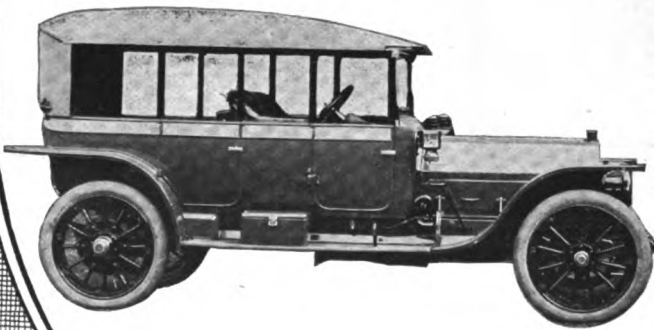


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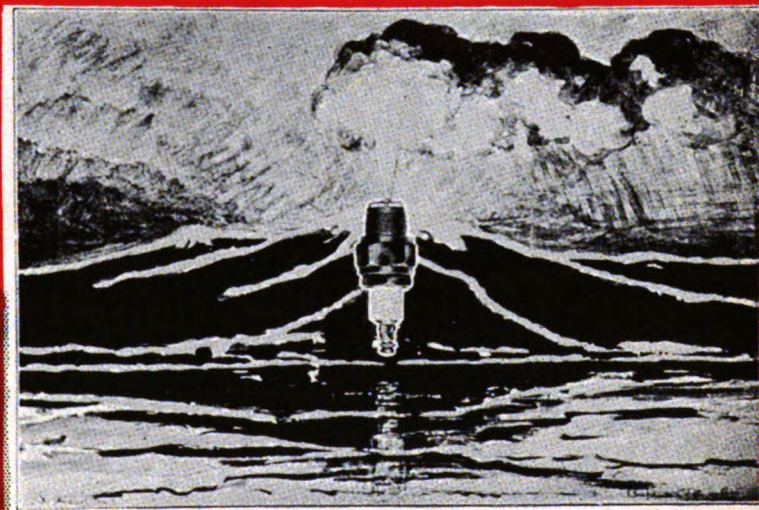
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"Cooper drove a Stutz in this campaign and naturally, therefore, the companion title—that of Champion Car for the year—belongs to the Hoosier concern manufacturing **'The car that made good in a day'—The Stutz.**

"It started fifteen times and only four times was it out of the money. In six of the fifteen starts the Stutz averaged better than 70 miles an hour, its fastest performance being 75.03 miles per hour, at Corona."

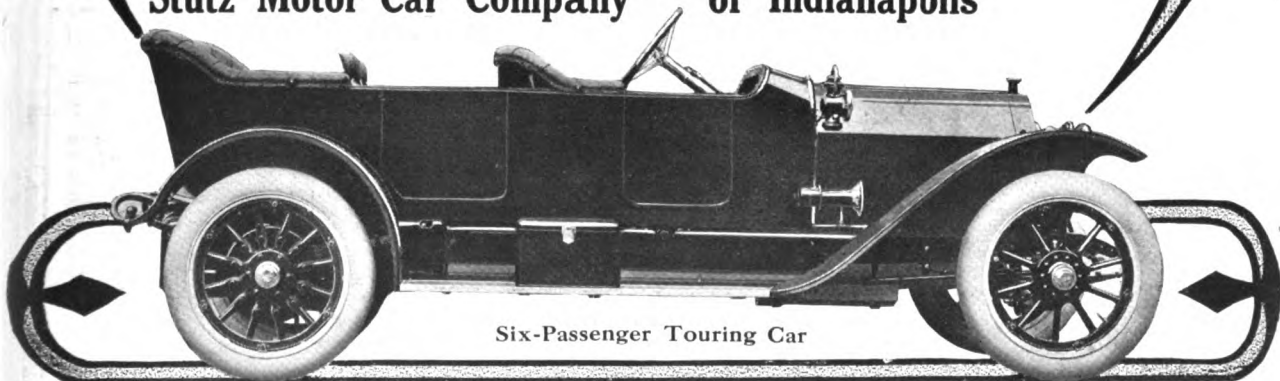
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**Stutz Motor Car Company of Indianapolis**



Six-Passenger Touring Car

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## PUBLISHERS' COMMENT.

The Big Boston Automobile Show will be held this year, March 7-14, for pleasure vehicles, and March 17-21, for commercial vehicles. The Boston truck display will be the only exhibition of this character of national importance this year. The annual pleasure car show always has been the largest in the country, and manufacturers have adopted the practise, in recent years, of reserving the announcement of new models until that time.

The Boston Show Numbers of The Automobile Journal will be issued Feb. 27, advance, and March 12, review. Inasmuch as this display comes at the opening of the active driving season and manufacturers will have completed their announcements, the buyer's references and guides prepared for these issues will present the most complete classifications covering the models offered for 1914. You cannot afford to miss these numbers. You will refer to them constantly throughout the coming season. They will contain information that could not be secured in any other manner. Order now—direct, or through your news dealer.

The Issue for Feb. 10 will contain a review of the annual national automobile show of the Middle West in Chicago. It has been the custom each year for some in the industry to reserve announcement of their new models for this display. It is anticipated that there will not be departure from this practise this year, and the forthcoming issue will present the details of these, in addition to any new accessories, supplies or fittings which may be revealed by the several concerns exhibiting at that show, who were not represented

in New York. Another feature will be the presentation of reports from the several local dealer's shows throughout the country.

The Special Department devoted to mechanical suggestions for new owners, see page 40, this issue, will be particularly valuable during 1914. The man who has acquired his first car is in need of advice and assistance, that he may be enabled to secure the utmost

from his new purchase, and it will be the aim of The Automobile Journal to supply this information in simple, non-technical language. New owners are specially invited to make full use of the correspondence columns of this magazine, when confronted by problems upon which they may need assistance. See also page 45.

Regular Readers of The Automobile Journal may keep well informed as to what is new in the accessory field by carefully following the department devoted to New Accessories for the Motorist, beginning this issue, on page 35. It is our purpose to make this one of the most newsworthy features of the magazine, and to this end manufacturers are invited to cooperate by submitting illustrations and descriptions of any new equipment which they may be placing in the market.

The Interest in Cyclecars has impelled The Automobile Journal to devote a special department to this latest type of vehicle. See page 49 of this issue.

Remember the Buyer's Guide, pages 87-96, when in need of anything new in pleasure or commercial cars, accessories, supplies and fittings. The concerns listed therein are reliable and are worthy of your patronage.

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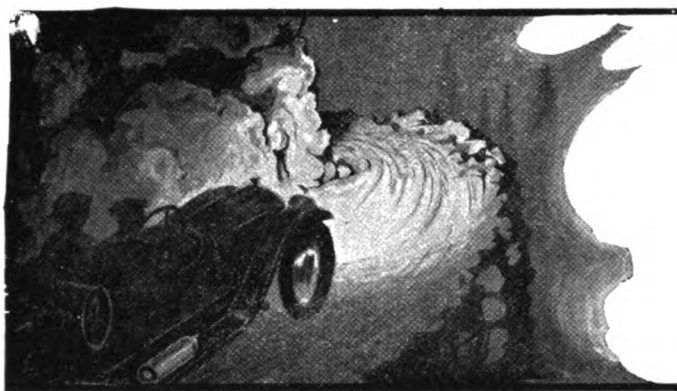
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Illuminates all of the road, spreads its beams to show a sudden turn, shows the path directly in front of the car, gives an even, steady, brilliant light without eye-tiring rings or deceptive shadows. As a practical road light it is far superior to electric light.

## Prest-O-Lite—

By actual test, is operated at one-fifth the cost of any electric system. In addition to the saving in cost, it means a saving in power of your engine, which gives your car added efficiency on hills and in emergencies.

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Affords every "press-the-button" convenience, and every light on the car may be lit or extinguished from the seat by the use of the Prest-O-Lite. And should this convenience ever fail, you may still have all the light by the use of a match.

## Prest-O-Lite—

Means a steady, reliable, economical supply of powerful light which no electrical system can guarantee. Actual experience is proving this fact every day. The absolute proof is yours for the asking.

### The Prest-O-Lite Co., Inc.

226 Speedway, Indianapolis, Ind.

Please send information on ALL Lighting Systems to—

## Electric Lights may fail at any moment!

You may drive for months and never meet an emergency

But when the emergency comes, you place your safety—and the safety of your passengers—upon your lights.

How is your car equipped to meet YOUR emergency

Prest-O-Lite for years, on hundreds of thousands of cars has proved its dependability.

Electric lights have proved decidedly unreliable.

A short circuit, the breaking of a delicate connection, failure to meet a sudden strain, time after time, has resulted in a blinding shock to the driver by the abrupt change from a dazzling beam of light to total darkness. Even if no accident results, there is little hope for a repair—the emergency lamp is gone with the rest of the system—and the only way out is to abandon the car until the expert can get there.

## The Dealer Knows!

Dealers are aware of these facts. Many of them have sunk a large part of their profits patching up the electrical troubles of their customers. From all parts of the country dealers have told us the story of their troubles with electricity. If your dealer doesn't tell you what he really knows about electric lighting—let us send you the letters of other dealers and expert electrical repairmen. Ask us.

## Use the Coupon!

## The Prest-O-Lite Co., Inc.

226 Speedway, Indianapolis, Ind.

(Contributor to Lincoln Highway)

Exchange Agencies Everywhere

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**of your car,  
dangerously skidding  
on the slippery  
pavement ahead——**

*You have neglected to put on Weed  
Chains.*

*You anxiously view the slippery pavement ahead, and have a mental picture  
of your car "side-swiping" a fellow motorist.*

Why nurse anxiety and coax calamity — why take such chances when you know

# Weed Anti-Skid Chains

## *Absolutely Prevent Skidding*

*If you don't equip your car with Weed Chains, and put them on when the roads are slippery and muddy or covered with snow and ice, you are taking chances on your own life and are a serious menace to every road user.*

Weed Chains *do not injure tires* even as much as one little slip or skid—They are slipped on in a minute without a jack—*they never fail* in an emergency. Join the *safety campaign*—exercise caution. *Equip your car with Weed Chains today.*

*Sold for ALL Tires by Dealers Everywhere*

**Weed Chain Tire Grip Company**  
28 Moore Street New York

*Manufactured for Canada by*  
Dominion Chain Company, Limited—Head Office: Shaughnessy Bldg., Montreal, Can.



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# THE AUTOMOBILE JOURNAL

VOL. XXXVI, No. 12

JANUARY 25, 1912

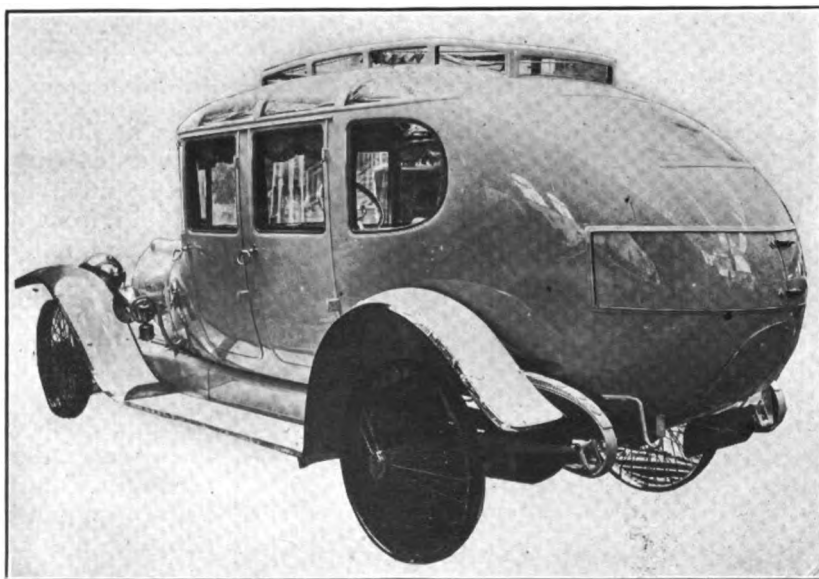
Price, \$1.00 the Year

## DISTINCTIVE FOREIGN BODY DESIGNS.

**Sales Methods Held to Be Responsible for Greater Development in This Field—  
Examples Selected Represent Coach Makers of France, Germany, Italy,  
Belgium and Great Britain—Effect upon American Makers.**

**A** MERICAN motorists have been led to believe that the sales methods in vogue in Great Britain and on the Continent of Europe, in which the chassis and body are sold separately, has resulted in extensive development of body design. It is true, for the most part, that particular attention has been paid to the matter of coach work, as it is termed abroad. Many of those engaged in this field have gradually taken it up in addition to their former production of bodies for horse drawn vehicles, and have been in business for years.

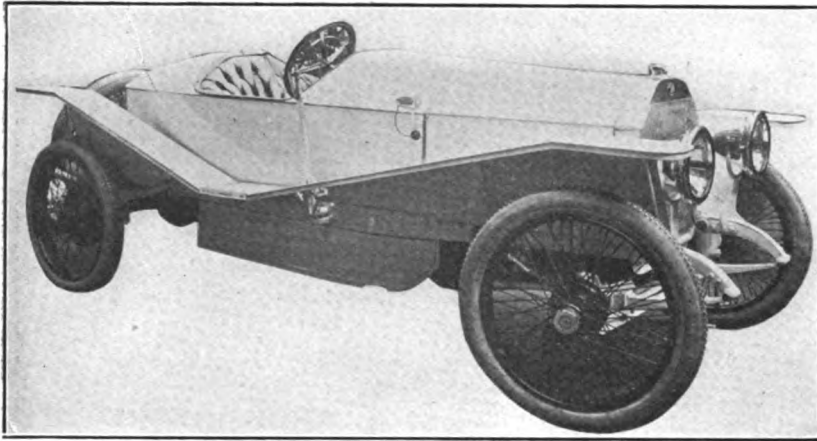
results in keen competition between rival coach makers. The car manufacturer often considers his work finished when he has sold the chassis, although some of the makers have a body department and others have contracts with certain houses to supply their customers wherever possible. Of course, the so-called standardized body exists abroad as well as in this country, but special reference is made herein to the opportunities for the coach maker who seeks to create that which is distinctive.



**Novel Type of Berline Limousine Body on Gregoire Chassis—Enlarged Space at the Rear Provides Three Separate Storage Compartments.**

The plan to which reference has been made Accompanying illustrations indicate how well some of these coach makers have succeeded in this





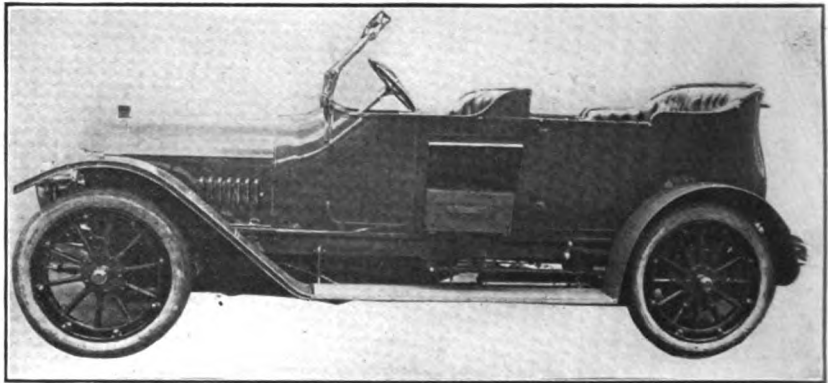
**S. P. A. Torpedo Roadster—Design Originated in Italy and Is Widely Copied.**

respect. Two extremes in the large enclosed type are presented in the Gregoire berline limousine and the "Triune" limousine. The Gregoire is a French machine, and the two bodies shown were produced by Paris designers.

The first of these not only provides luxurious accommodations for the occupants, including the driver, but a particular feature of the design lies in the storage compartments at the rear. There are in reality three compartments, although the reproduction does not reveal the upper and lower except upon closer study. The middle space is for tires, or a spare wheel. There is a double horizontal door, opening from the middle, which permits easy access to the entire interior. Above this is a compartment for luggage, with sufficient room to accommodate all the equipment that is re-

quired for a long tour. Below the tire space is another for tools, etc.

The "Triune" model is decidedly pretentious. The first appearance is that of three separate coupe type bodies in one. The two at the rear comprise one compartment, which is entirely shut off from that of the driver in front, doors leading to each. Particular attention is drawn to the arrangement of the windows to carry out the artistic effect of the design. There is opportunity, at least, for a difference of opinion as to the beauty of the double trunk on top, but as to its utility in providing storage space for tools, equipment, lug-

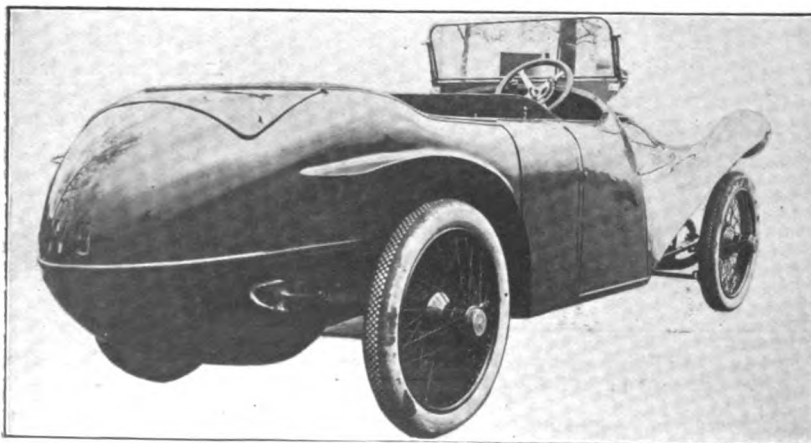


**Benz Touring Car Body, with Compartment for Luggage Under Front Seat.**

gage, etc., there can be little room for doubt.

It might be suggested that the designer of the touring car body fitted to a Turcat-Mery chassis, shown in both front and three-quarter rear views, followed the advice of the proverb, beginning, "Go to the ant", particularly when the rear portion alone is considered. This is another attempt to provide storage space at the back of the car. The front view indicates the method utilized in deflecting air currents downward, and it also will be noted that the designer has made use of all available space for seating accommodations by eliminating the running board entirely.

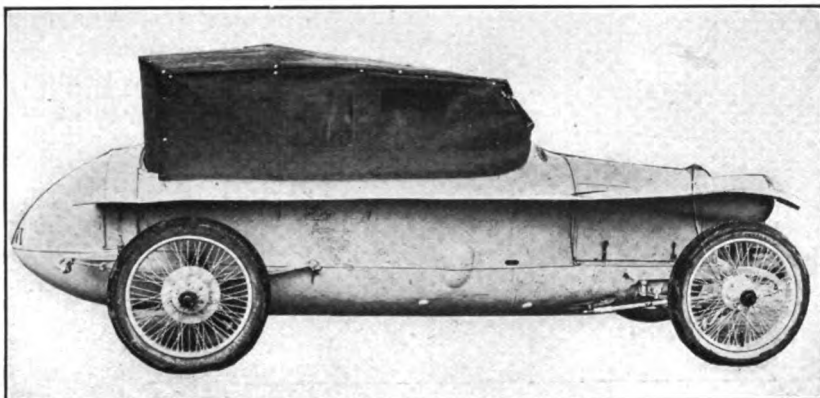
Still another Turcat-Mery design is presented, this being an adaptation of a few additional



**Rear View of Turcat-Mery Touring Car—An Interesting Design.**



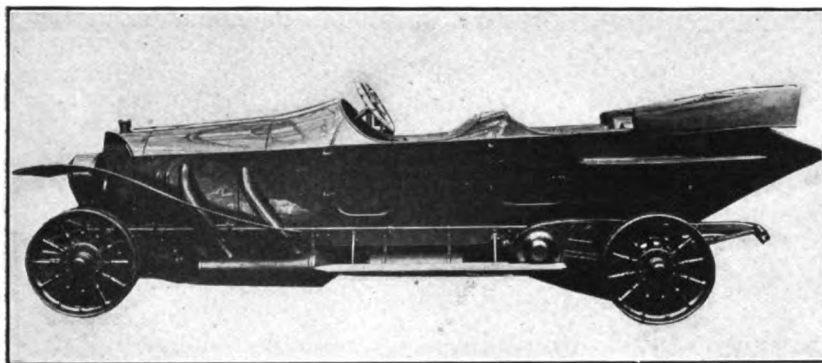
features to the standard touring car body produced for this concern. One of these is to be found in the fenders, which, instead of curving downward to meet the customary running board, are carried straight across from front to rear. It might almost be said that this was a result of the Turcat-Mery firm's study of aeroplane design, in that this arrangement is expected to give the car unusual speed possibilities. Another feature is the provision for protecting the occupants from inclement weather. Ordinarily the machine is of the open body type, but the top in question completely encloses both front and rear seats, the interior being lighted



**The Result of Aeroplane Production Is Reflected in This Turcat-Mery Model.**

merely a thin, straight piece of metal so arranged as to reduce wind resistance to a minimum.

The S. P. A. torpedo roadster design is of Italian origin, and has made its appearance in this country for the 1914 season. By this is meant that bodies following closely the general tendency of this type are now being offered as standard equipment by American manufacturers. In some instances there is noted a more gradual sweep of the fenders than appears in the illustration shown, but in general lines this is a design which has been widely copied both here and abroad.



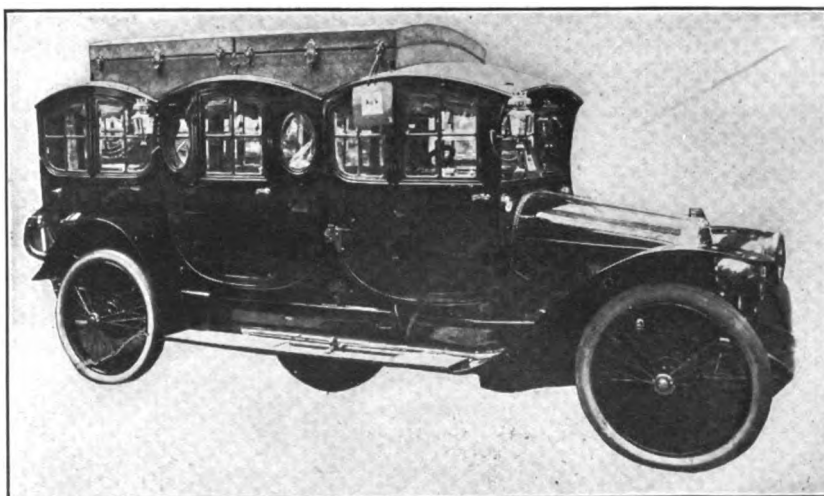
**The Streamline Effect Presented by Mercedes Double Torpedo.**

only by windows located in the side and front.

Two German body installations are shown in the illustrations of the Benz and Mercedes. The former is a touring car of pleasing streamline design, not unlike some which have made their appearance as standard equipment in this country. A distinctive feature lies in the provision of a compartment underneath the front seat, with door opening at the side, for a trunk, or other touring paraphernalia.

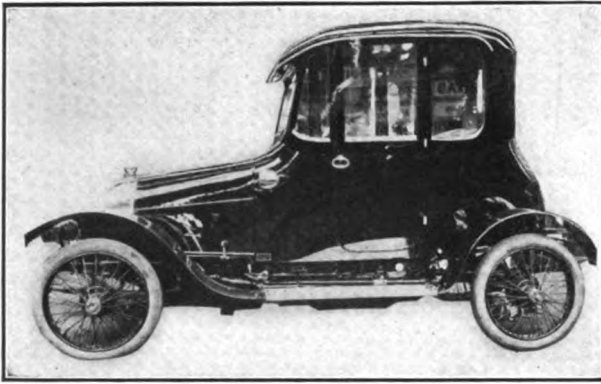
The Mercedes body is termed a double torpedo. The streamline effect is very strongly emphasized throughout, and particularly so at the pointed rear. It will be noted that the front fenders sweep downward toward the short running board, and that the rear fenders are

Many Belgian body designs have found their way to this country, several of the coach makers in Brussels being quite as well known in America as those of Paris. A Belgian



**Elaborate "Triune" Limousine Body Fitted to Gregoire Chassis.**





**Coupe Body of Attractive Design Fitted to Mathis Chassis.**

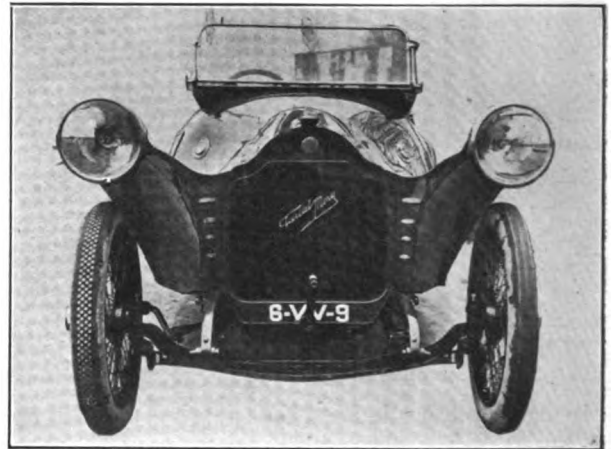
design for a small car is presented in the illustration of the Mathis, a chassis rated at eight horsepower under the R. A. C. formula, which is the same as that known as the S. A. E. here. This undoubtedly would be termed a coupe in this country, a type that is gaining very rapidly in popularity, but it is designated an enclosed voiturette abroad.

British motoring prints lay decided stress upon the matter of body design, and any demonstration of what is considered neat and attractive by the British motoring public always is of interest. The convertible body shown fitted to a Phoenix chassis has several distinctive features. Two views are presented, but these are hardly more than a suggestion, since the possible combinations are quite numerous.

In the view at the left the car is shown completely enclosed, save for the auxiliary seat at the rear. That at the right indicates the appearance of the machine when utilized as an open roadster, with the rear seat closed. The semi-circular top is so designed that it disappears into recesses, front and rear, and it readily will be seen that either half may be in place at the option of the occupants. A ventilating windshield, or

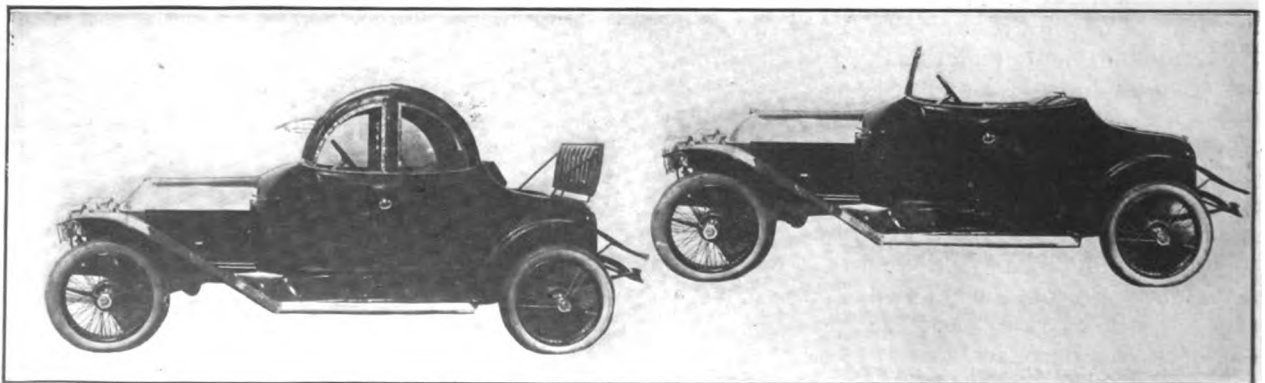
screen as it is termed in England, is fitted to the forward portion, and this may be tilted at any angle to meet the exigencies of the occasion.

While it might be contended that the examples selected, chosen at random, were somewhat extreme, the intention has been to present some rather unusual models as indicating the manner in which European designers are seeking to satisfy a demand for something distinctive. A comparison of the standard bodies offered by motor car manufacturers in this country will suggest that they have adopted what they believe to be the most satisfactory features of the several designs presented. And it may be added that there are special body makers in America who have originated designs quite as artistic in every respect as are to be found abroad. The lines of these also have found their way into the standardized models produced by automobile manufacturers. Undoubtedly, the work of foreign



**Front View of Turcat-Mery Touring Car Shown on Page 16.**

coach makers has had an important influence on body design in this country, but many handsome designs have originated on this side of the water.



**A British Conception of the Convertible Body Type as Exemplified by the Phoenix Roadster Model.**



## BIG ATTENDANCE AND GOOD BUSINESS.

**Record Breaking Crowds and Increased Sales Figures Reported of Local Shows in Eight Widely Separated Cities—Splendid Outlook for 1914 Season.**

**I**N THE interval between the closing of the New York national automobile show, Jan. 10, and the opening of the Chicago display in the Coliseum and First Regiment armory, Jan. 24, the attention of the motor car industry has been directed toward the so-called minor show circuit. This term is fast becoming a misnomer, because of the fact that the exhibitions conducted under the auspices of the dealers in various sections of the country are gaining rapidly in importance.

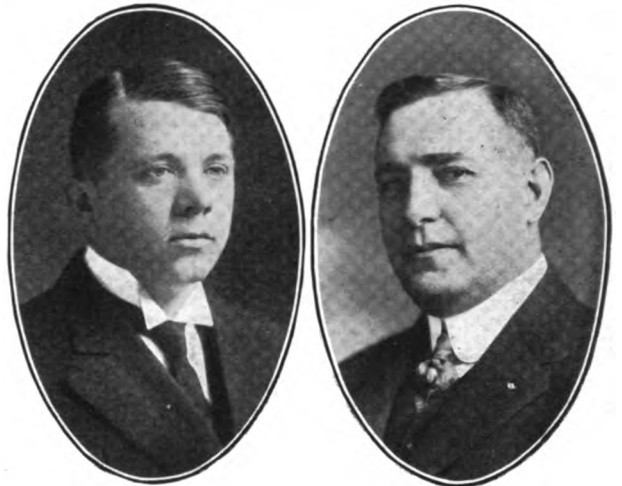
The interest in automobile shows, no matter where held, this year has been increased very materially, as a result of the attempt in certain quarters to suggest that business conditions generally were having, or were to have, a somewhat depressing effect upon the sale of cars during 1914. This was amply refuted by the New York exhibition, but it might be contended that the situation revealed thereby was somewhat local in character, or, at least, sectional.

It is expected that the Chicago show will result in another splendid success, from the fact that the national display in that city has been noted for the enthusiasm created among dealers, owners and prospective owners in the section of the country for which Chicago is the metropolis. The industry will be surprised if any other condition is revealed this year.

But because of the importance of the local show as a business barometer, the industry has awaited reports from the displays held during the past two weeks with unusual interest. The results have been reassuring beyond all expecta-

tions. If there is any feeling of unrest on the part of the buying public it has yet to be revealed.

From Philadelphia, Bridgeport, Baltimore and Washington on the Atlantic Coast to Los Angeles on the Pacific, with Detroit, Pittsburg, Cleveland and Milwaukee, representing widely separated inland districts, comes information



At Left, President W. P. Herbert; at Right, Show Manager Louis Block, Philadelphia Automobile Trade Association.

that not only has the attendance been larger than ever before, but the number and value of sales have created new records as well. The following reports present a most optimistic view of the situation, and are particularly encouraging to those who have the welfare of the industry at heart, whether manufacturers, dealers or owners.

## PHILADELPHIA DEALERS OPTIMISTIC.

**D**EALERS in Philadelphia are particularly pleased because of the new record in attendance and sales which resulted from the 13th annual display of the Philadelphia Automobile Trade Association, Jan. 10-17. The only regret expressed by any member of the association has been with respect to the decision not to hold a truck show this year. Conditions are held to be such that some such stimulation would prove of decided value to those representing commercial vehicle manufacturers.

As is true of many other centres in the country, the dealers of Philadelphia have found op-

portunity during 1913 to study the conditions which must be met and to reorganize their business methods to conform to present day needs. As a result there has been such concentration of effort, particularly during the closing six months of the year, that the number of sales for 1913 was larger than ever before and the profits as well.

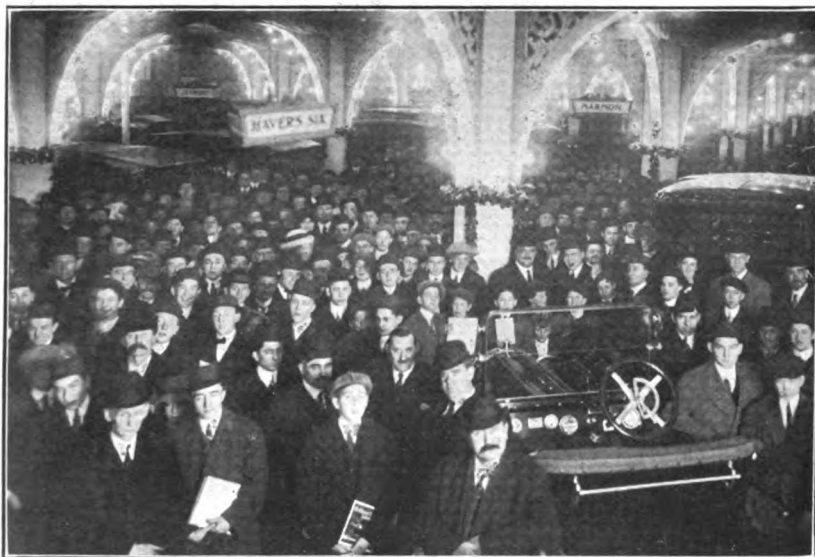
Members of the association were enthusiastic about the show, and much effort was expended in making it an event in the history of the automobile industry in that city. For the first time in several years opportunity was had to examine



all of the models under one roof. One hundred and fifty-nine cars, representing the product of 64 makers, were on display, indicating in no small measure the possibilities of the motor car market in that centre.

The exhibition was held in the new Metropolitan building, Broad and Wallace streets, the architecture of which enabled the committee in charge to provide a setting well worthy of the best the industry has produced. The interior was treated to represent a grand French court of the Louis XVI period. The color scheme was old rose, ivory and gold, with garlands of natural foliage artistically festooned about the many large columns.

Louis C. Block was chairman of the show committee, which also included William P. Her-



A Corner of the Metropolitan Building, Philadelphia, During the Progress of the Automobile Show, Indicating Extent of the Crowd.

bert, the new president of the association; Ralph W. Cook, the new vice president; J. E. Gomery, honorary secretary and treasurer; H. Warren Terry as secretary and E. C. Johnson. Among the exhibitors were the following:

**Gasoline Cars**—V. P. Padula Motor Company, Havers; Automobile Company of Philadelphia, Marmon, Cole; White Company, White; Tioga Automobile Company, Hupmobile; J. Henry Schumaker & Co., Dorris; Fiat Motor Company, Fiat; W. P. Lippincott, Imperial; Johnson Motor Car Company, Haynes; American Auto Company, American; Motor Sales Company, National, Henderson; Ford Motor Company, Ford; Garford-Philadelphia Company, Willys-Knight; Mercer Motor Company, Mercer; Cartercar Motor Company, Cartercar; Detroiter-Philadelphia Company, Detroiter; Overland-Marion Company, Overland; Kissel Motor Car Company, Kissel-Kar; Winton Motor Car Company, Winton; Foss-Hughes Company, Pierce-Arrow; W. W. Gawthrop, Davis; Jackson-Stutz Sales Company, Stutz; Oldsmobile Company, Oldsmobile; A. G. Spalding & Bro., Stevens-Duryea; T. B. Jeffery Company, Jeffery; F. B. Stearns Company, Stearns-Knight;

Sweeten Auto Company, Franklin; Touraine Motor Company, Touraine; Oakland Motor Company, Oakland; Locomobile Company, Locomobile; Packard Motor Car Company, Packard; Chalmers Motor Company, Chalmers; Minerva Motors Company, Minerva, Monn; Peerless Motor Car Company, Peerless; Gomery-Schwartz Motor Company, Hudson; Gibbons-Wetherill Company, Maxwell; Buick Motor Car Company, Buick; Studebaker Corporation, Studebaker; Colonial Motor Company, Partin-Palmer; E. C. Johnson Company, Reo, Premier; Thornton-Fuller Auto Company, Simplex; Standard Motor Car Company, Velle; Fanning-Paxson Company, Mitchell; Regal Sales Organization, Regal; Auto Sales Organization, Cadillac; Bigelow-Willey Motor Company, Lozier, Paige; Chandler Motor Car Company, Chandler.

**Electric Cars**—J. C. Bartlett, Detroit, Argo; Seltzer-McCowan Company, Ohio; A. G. Spalding & Bro., Waverley; C. A. Haines & Co., Baker.

**Steam Cars**—Stanley Motor Car Company, Stanley.

**Accessories**—J. Eavenson & Sons, Gibney Motor Supply Company, Keystone Lubricating Company, J. H. McCullough & Son.

At the conclusion of the show several members of the association expressed themselves very optimistically concerning the prospects for the immediate future. A few of them are quoted below:

**President William P. Herbert**—Aside from the splendid success of the show from an attendance and business standpoint, it has proven of value in creating an atmosphere of confidence and enthusiasm. The public has demonstrated its interest by attending in larger numbers than ever before. The exhibitors are filled with courage and confidence in the future, hard to estimate.

**Chairman Louis Block**—It is shortsightedness to decry the importance of the show as an institution. It brings the people to look over the year's motor car offerings as nothing else under the sun could do. They come from all walks of life—every manufacturer has his goods displayed to a splendid purchasing audience, and the tremendous value of it all from a trade standpoint is apparent on the face of it.

**Vice President Ralph W. Cook**—When the money market is affected, the handlers of the luxurious cars are first to suffer. It may go down the whole line, but the highest priced goods are the first to feel the slump, beyond a doubt. But, from our experience, and from the experience of others with whom I have talked, our show has demonstrated a wonderful revival of business. Our show crowds are catholic in taste—no one particular priced car has any advantage—it is encouraging activity all along the line. Buyers realize today they are getting more for their money than they ever did before, and everything indicates a prosperous year.

**J. E. Gomery, Hudson Distributor**—As a trade boom and an advertising medium for the industry an annual automobile show can't be beaten. If I had my way, Philadelphia would have had a truck show, too, but the majority thought otherwise. Granted that a truck exhibit does not have the advantage of the spectacular—as an educator of the possibilities of motor vehicle transportation, it would be invaluable to the industry.

**E. B. Jackson, Packard Manager**—I believe that the period of rumors about the automobile business has about passed over and that this industry has settled down to normal conditions again. The fireworks that the public were looking for did not come off, and I believe that, for the most part, they are getting tired waiting for them and are willing to accept conditions as they exist. The truck business in particular is in an active process of rejuvenation and we are looking forward to a good year's business in that field.



## SUCCESSFUL SHOW IN LOS ANGELES.

**D**URING the week in which New York City was experiencing the biggest automobile show of its history, Jan. 3-10, the first organized exhibition of motor cars in Los Angeles, Cal., in three years, was being held in the Grand avenue pavilion. Only 25 different makers were represented, but the show was a success in every respect. It may be added, in this connection, that the Los Angeles Motor Car Dealers' Association did not co-operate with the management, and only two of its members made display.

Business conditions, insofar as the automobile industry is concerned, are particularly good in southern California at this time. The registrations show that some 17,000 cars were sold in this territory during 1913. The situation is altogether unlike that which exists in practically every other section, in that the district of which

Los Angeles may be regarded as the commercial centre, is so-called virgin country. By this is meant that a great deal of development work is under way, and the people are only just beginning to become sufficiently settled in a business way to gratify their desires in many respects. The territory is rich in possibilities, and all dealers, whether they took part in the recent show or not, are decidedly optimistic as to the immediate future.

The interior of the building was made particularly attractive by the use of some 5000 square feet of mirrors, large Japanese umbrellas, dwarf trees, pagoda effects and foliage, amid which twinkled nearly 4000 electric lights. In addition to the 25 makes of cars there were about 35 accessory houses represented. The attendance was estimated at nearly 70,000.

## ONE HUNDRED SALES IN BRIDGEPORT.

**A**LTHOUGH Bridgeport, Conn., is within 75 miles of Grand Central Palace, where the most largely attended show New York City ever has known was held during the week of Jan. 3-10, it has been ably demonstrated that it is possible to attract the people of that city to a local

way were such as to inspire new confidence in the dealers of that city. Immediately after the close of the exhibition over 100 sales were reported, and the number of prospects for sales in the near future were said to be decidedly bright. The list of exhibitors included the following:



Simple and Attractive Setting in Which the Season's Models Were Displayed by the Dealers in Bridgeport, Conn.

dealer's display directly after the closing of the national exhibition. The third annual Bridgeport show was held in the state armory, Jan. 12-17, under the management of B. B. Steiber.

Not only was the attendance larger this year than ever before, but the results in a business

**Pleasure Cars**—Erwin M. Jennings Company, Hudson, Stevens-Duryea; J. L. Carpenter, Hupmobile, Baker electric; Starbuck & Mattice, Ford; Consolidated Motor Car Company, Abbott-Detroit; Arthur L. Clark, Buick, Franklin; Harry M. Ford, Oakland; George W. Wuestfelt (New Haven), Pierce-Arrow; O. H. Banks (Norwalk), Moyer; Detroit Cadillac Motor Car Company, Cadillac; Carl H. Page, Chalmers; Harry Ford, Metz, Stutz, Reo; Blue Ribbon Garage, Packard; Buckley Auto Station, Paige,



Chandler, Lozier; Peck & Lines, K-R-I-T, Haynes; Elm Auto Company, Mitchell, Cole, Studebaker.

**Commercial Cars**—J. L. Carpenter, Standard, Federal; Consolidated Motor Car Company, Selden.

**Special Bodies**—Metropolitan Auto & Carriage Company, Blue Ribbon Auto & Carriage Company, R. A. Rantz.

**Cyclecars**—Clarendon Oil Company, Imp. Trumbull.

**Motorcycles**—Burroughs Company, Excelsior.

**Accessories**—Erwin M. Jennings Company, general line; Harry M. Ford, carburetors; Blue Ribbon Garage, general line; Rutherford Tire Company, tires; Clarendon Oil Company, truck tires and tire chains; Pyrene Manufacturing Company, fire extinguishers; Auto Leather Goods Company, leather goods; Standard Parts Manufacturing Company, horns; Standard Signal Light Company, Vacuum Mabiloils.

## RECORD ATTENDANCE FOR BALTIMORE.

**F**OR the eighth year the automobile dealers of Baltimore, Md., placed their wares before the people of that city and vicinity for inspection, Jan. 20-24. This year the display was made in the Fifth Regiment armory, where abundant opportunity was afforded to exhibit the various makes of cars and trucks and accessories on one floor. The event was under the auspices of the Baltimore Automobile Dealers' Association, assisted by the Automobile Club of Maryland.

Secretary H. M. Luzius of the club acted as

space was devoted to the exhibition of trucks and business wagons as to passenger machines:

**Pleasure Cars**—Colonial Motor Company, Studebaker, Stearns-Knight; Motor Car Company, Stevens-Duryea, Overland; Rice's Garage, Pathfinder; Gilbert A. Wehr, Reo; Franklin Motor Company, Franklin; Haynes Motor Sales Company, Haynes, King; Poehlmann Automobile Company, Cole, Chandler, Chevrolet; Model Auto Company, Apperson; Beehler & Ogden, K-R-I-T; Mar-Del Mobile Company, Packard; Eastwick Motor Company, Ford; Carl Spoerer's Sons Company, Spoerer; Club Garage, Mercer; Zell Motor Company, Chalmers, Rauch & Lang electric; Walter Scott, Marmon, Premier; Schell-Crouch Auto Company, Lozier, Paige; Winterson Automobile Company, Cartercar; Winton Motor Company, Win-



A Section of the Main Floor, Motor Square Garden, Pittsburg, Penn., Where First 1914 Pittsburg Show Was Held.

show manager and arranged a decorative scheme well calculated to transform the interior of the building into a proper setting for the various exhibits. The other members of the committee were: F. S. Bliven, E. R. Meyers, R. J. W. Hamil and T. W. Wilson, Jr., for the association, and Dr. H. M. Rowe, John S. Bridges and J. G. Nassauer for the club.

As was true of the Philadelphia and Washington displays, the attendance at Baltimore exceeded all previous records, and reports from that city soon after the show opened indicated a very satisfactory business. A particularly pleasing feature of the display was the interest created in commercial vehicles and it will be noted by the following list of exhibitors that almost as much

ton; Foss-Hughes Company, Pierce-Arrow; Standard Motor Company, Cadillac; Locomobile Company of America, Locomobile; Oakland Motor Company, Oakland; Cook & Fletcher, Stanley steam; White Motor Company, White; Ditch, Bowers & Taylor, Inc., Detroit electric; Auto Outing Company, Buick; Lambert Auto Company, Hudson; Mitchell Auto Company, Mitchell; F. W. Sandruck, Jr., Palmer-Singer; Charter Automobile Company, Havers; Auto Sales Company, Car-Nation; Imp Cyclecar Company, Imp cyclecar; Vordemberge Motor Company, Pathfinder.

**Commercial Cars**—Motor Car Company, Willys Utility; Vordemberge Motor Company, Koehler; Mar-Del Mobile Company, Packard; G. P. Kurtz, Garford; Allen W. Fulton Company, Lauth-Juergens; Foss-Hughes Company, Pierce-Arrow; Nelly & Ensor, Kelly; White Motor Company, White; International Service Company, Mack, Saurer; International Harvester Company of America, I. H. C.; Oakland Motor Company, Federal; Autocar Sales & Service Company, Autocar.

**Accessories**—Federal Tire Sales Company, tires; C. B. Pruden Company, portable garages; Auto Supply Company, general line; Reus Bros. Company, bearings, tires.

**Motorcycles**—Sandruck Motor Company, Flying Merkel.



## GREAT ENTHUSIASM IN PITTSBURG.

**P**ITTSBURG, Penn., is one of the few cities in the country which will hold two automobile shows this year. The first was held in Motor Square Garden, Jan. 17-24, under the auspices of the Pittsburg Automobile Dealers' Association, and the second will be held in Exposition hall, Feb. 14-21, under the direction of the Pittsburg Auto Show Association. If the latter meets with the same degree of success which attended the former, there will be little doubt as to the enthusiasm of the people in the district of which Pittsburg is the centre. For that matter, there is no doubt in the minds of the members of the dealers' association now.

The show just closed was unique in one respect, in that it virtually was two shows in one. The show committee, consisting of W. N. Murray, E. Kiser, Wilson McClintock, W. W. Bennett, Ray McAllister, C. E. Vestal, I. C. Meyers, W. Murray Carr and Frank D. Saupp, offered a prize for the oldest gasoline propelled vehicle still in service, and this contest resulted in one of the most interesting collections of "relics" yet assembled in this country. This portion of the display was held outside the building, as indicated by an accompanying illustration, and the vehicles offered a sharp contrast with the 1914 models in the hall proper. The car occupying a prominent place in the picture bore a placard with the following inscription:

This Oldsmobile has never had a replacement of parts. Ran by its own power from McKee's Rocks to East Liberty this morning. Has been driven 300,000 miles.

W. H. LaFountain was manager of the show, which was the eighth to be held under the aus-

pices of the dealers' association. He is particularly pleased with the results, as evidenced both by the attendance and the number of sales. The interior of the building was treated with a color scheme of apple green and white, with a touch of red in the upper canopy. The side walls were made to match the ceiling and the floor decorations were in white. The electrical display was particularly appropriate, with a profusion of large art globes of the lead or cathedral type, made in the form of tulips, roses, etc.

The list of exhibitors included the following:

**Gasoline Cars**—Averman-Lynn, Inc., Lozier; Abbott Motor Car Company, Abbott-Detroit; Bennett Motor Car Company, King, Pope-Hartford; Eddie Bald Motor Car Company, Hudson; Buick Motor Company, Buick; Ford Motor Company, Ford; Franklin Motor Car Company, Franklin; Hiland Auto Company, Peerless; G. H. Hopkins, American; Klingler Company, Imperial, Palmer-Singer; Locomobile Company, Locomobile; L. G. Martin, Jeffery; Miller Auto Company, Crawford; McAllister Bros., Cadillac; McCurdy-May Company, Pierce-Arrow; Pittsburg Chalmers Company, Chalmers, Reo; Pittsburg Mercer



W. N. Murray, President, Pittsburg Automobile Dealers' Association.



Collection of "Old Timers" Dating from 1898, Assembled Outside the Pittsburg Show in a Novel Prize Contest.



Company, Mercer, Jackson, Stearns-Knight; Pittsburg Haynes Company, Haynes; Oakmont Motor Boat Company, Pathfinder, Wahl; Oakland Motor Car Company, Oakland; Packard Motor Company, Packard; Oldsmobile Company, Oldsmobile; Painter-Dunn Company, Overland; Poffinberger Motor Company, Marmon; T. M. Pepperday Company, Simplex, S. G. V.; E. J. Thompson Company, Flat; Vestal Motor Car Company, Stevens-Duryea; Winton Motor Car Company, Winton; White Company, White; Hamilton Motor Car Company, Keeton; W. C. Rea, Speedwell.

**Electric Cars**—Baker Electric Sales Company, Baker; East End Auto Company, Waverley; Klingler Company,

Ohio; R. & L. Sales Company, Rauch & Lang.

**Accessories**—Aetna Life Insurance Company, Automobile Accessories Company, Blodgett Sales Company, P. V. Blond, Chemical Rubber Company, Doubleday-Hill Electric Company, Dyke Motor Supply Company, Gasoline Supply Company, Hoover & Hurst, Keystone Lubricating Company, Keystone Shock Absorber Company, Liberty Brazing & Welding Company, Pittsburg Rubber Company, Pyrene Manufacturing Company, Pittsburg Auto Equipment Company, Pittsburg Spring Company, Alex. Peacock Company, Williams & Co., H. W. Johns-Manville Company, Joseph Woodwell Company, Jackson Motor Supply Company, Iron City Spring Company.

## TRUCKS THE FEATURE AT DETROIT.

CONSIDERING the fact that Detroit is regarded as the heart of the automobile industry, and that a large percentage of the population is connected with the industry or its allied interests in one form or another, it would hardly seem, upon first thought, that an automobile show in that city would be an attraction that would draw a large number of people. Yet for 13 consecutive years an event of this character has been held in that city—during recent years under the auspices of the Detroit Automobile Dealers' Association.

Not only has the attendance at each succeeding show been larger than at any of its predecessors, but the demand for space has grown more insistent each year. The latter factor presents a problem which those in charge of the arrangements find more and more difficult to solve. For the 1914 display, which was held Jan. 17-24, it was at first thought that it would be necessary to erect a temporary structure, but at the last moment, Henry Ford of the Ford Motor Company, placed the new assembly building of that concern at the disposal of the committee. The exhibits were staged on three floors of this structure.

The 13th annual Detroit show was particularly notable for the interest created in the commercial motor vehicle. The number of makes on display was not sufficient to excite special comment, in view of the importance of the city as an automobile centre, and this will doubtless be remembered by those manufacturers of trucks and business wagons who were not represented.

The commercial vehicle section also was of importance from the introduction of an entirely new truck, the Pull-More, made by the Pull-More Motor Truck Company, Detroit. This is a front wheel drive machine, possessing a number of novel features. The construction is termed by the maker a two-unit plan, by which is meant that the power unit, consisting of the motor and all the mechanism, is entirely apart from that carrying the load, virtually a two-wheeled tractor.

The show was under the direction of a special committee, consisting of President Joseph Schultze, Secretary Frank N. Sealand, Treasurer C. C. Starkweather and Directors W. J. Gordon and George Reason. Walter Wilmot, who has been show manager for a number of years, again held that position. The exhibitors included the following:

**Gasoline Pleasure Cars**—Buick Motor Company, Buick; Cadillac Motor Car Company, Cadillac; Standard Auto Company, Packard; Winton Motor Car Company, Winton; Oakland Motor Car Company, Oakland; Grant Bros. Auto Company, Grant, Chandler; Neuman-Lane Company, Chalmers, Pierce-Arrow; Overland Detroit Company, Overland; Cunningham Auto Company, Maxwell; M. A. Young, Reo; Ford Motor Company, Ford; Oldsmobile Company, Oldsmobile; Wetmore-Quinn Company, Lozier, Paige; Grasser Motor Company, Hupmobile; Siegel-Zackendorf Company, Cole; Keeton Motor Company, Keeton, Car-Nation; P. W. Schulte & Sons, Paterson; Jackson Automobile Company, Jackson; Cartercar Company, Cartercar; Studebaker Corporation, Studebaker; K-R-I-T Motor Sales Company, K-R-I-T; Bomd-Robinson Company, Hudson; Postal-Fair Motor Company, Peerless; Regal Motor Sales Company, Regal; Gaston-Richardson Company, Abbott-Detroit; J. P. Schnelder, Chevrolet; Havers Motor Car Company, Havers; King Motor Sales Company, King; Foster Motor Sales Company, Stevens-Duryea, Imperial; Perrett-Barber Motor Sales Company, Detroit; Thomas J. Doyle, Saxon.

**Electric Pleasure Cars**—Detroit Electric Garage, Detroit; Century Electric Car Company, Century; Grinnell Electric Car Company, Grinnell; Electric Automobile Company, Standard; Edward I. Rumsey, Ohio; Henry L. Walker Company, Woods.

**Commercial Cars**—Buick Motor Company, Buick; Standard Auto Company, Standard; Thompson Auto Company, Wagenhals, Federal, Universal; Studebaker Corporation, Studebaker; General Motors Truck Company, GMC; Star Tribune Motor Sales Company, Star, Tribune, O. K.; International Harvester Company of America, I. H. C.; Pull-More Motor Truck Company, Pull-More; Commerce Motor Car Sales Company, Commerce; Kelly Truck Company, Kelly.

**Cyclecars**—LaVigne Cyclecar Company, LaVigne; Scripps-Booth Cyclecar Company, Rocket, Packet; Mercury Cyclecar Company, Mercury; Cricket Cyclecar Company, Cricket; Hawk Motor Car Company, Hawk; Detroit Cyclecar Company, Detroit.

**Motorcycles**—W. E. Wandersee Company, Harley-Davidson.

**Accessories**—Chas. E. Miller, Armitage Leather Company, Wayne Oil Tank & Pump Company, Paragon Refining Company, Sewell Cushion Wheel Company, Sears-Cross Company, Indian Refining Company, White Star Refining Company, Automobile Supply Company, Farmer Manufacturing Company, Jackson-Church-Wilcox Company, M. & S. Gear Company, National Refining Company, Cleveland Worm & Gear Company, H. W. Johns-Manville Company, Visco Motor Oils Company, Acme Enamelling & Japanning Company, Fidelity & Casualty Company, National Can Company.



## PRESIDENT OPENS WASHINGTON DISPLAY.

**W**HEN President Wilson pressed a button at the White House at 8 in the evening of Jan. 19, a large American flag, which had been hung at the highest point of the Convention hall, in Washington, D. C., unfurled and dropped down in the centre of the hall, and the second annual automobile show of the Washington Automobile Dealers' Association was formally opened. Eighty cars and trucks, representing the product of some 30 makers, were on display, and the exhibition of accessories was most complete.

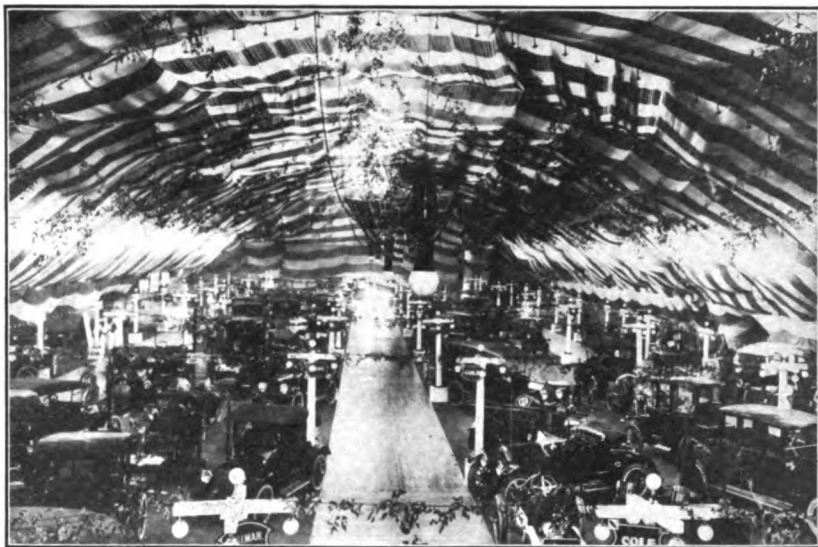
The color scheme this year was white and gold. The entire ceiling was covered with material of these colors, effectually concealing the girders, etc. The side walls were treated in a similar manner. The floor was covered with green burlap to represent a greensward, and at intervals along the main aisle, dividing the exhibition spaces, were a number of ornamental lamp posts, with side arms, still further accentuating this effect.

T. Oliver Probey was chairman of the show committee, and he was ably assisted by Charles W. Semmes, vice chairman; R. Bruce Emerson, secretary; Arthur Foraker, treasurer; F. C. Sibbald, J. H. Johnson, Jr., William P. Barnhart, T. Lamar Jackson, C. H. Warrington and Irving J. Henderson. The list of exhibitors included the following:

**Gasoline Pleasure Cars**—Automobile Sales Company, Lozier; Briscoe Motor Car Company, Briscoe; Cole Motor Sales Company, Cole; Davis Motor Car Company, Davis;

Emerson & Orme, Apperson; Henderson-Rowe Auto Company, Chevrolet; Hupp Motor Car Company, Hupmobile; Hudson Automobile Company, Hudson; William P. Barnhart & Co., King, Pullman; T. Lamar Jackson, Stevens-Duryea; Kline Motor Car Corporation, Kline-Kar; Krit-Washington Motor Car Company, K-R-I-T; Mitchell Lewis Motor Car Company, Mitchell; Potomac Motor Car Company, Marmon; Probey-Haynes Motor Company, Haynes; Regal Motor Car Company, Regal; W. L. Smith Company, Detroit; Warrington Motor Car Company, Palmer-Singer; Winton Motor Car Company, Winton.

**Electric Pleasure Cars**—Emerson & Orme, Detroit; Hudson Automobile Company, Argo; William P. Barnhart & Co., Standard; Ohio Electric Car Company, Ohio; Poto-



General View of the Main Floor, Convention Hall, at the Opening of the Washington Dealers' Show.

mac Motor Car Company, Woods.

**Commercial Cars**—Congressional Garage, Wilcox; R. E. Lankford, Indiana.

**Cyclecars**—Imp Cyclecar Company, Imp.

**Accessories**—Barber & Ross, supplies; Irvin T. Donohoe, supplies; National Electric Supply Company, electric supplies; Chesley & Herveycutter, shock absorbers and lamps; Edison Storage Battery Company, Edison batteries; A. H. Gregory, marine engines; Miller-Dudley Company, magnetos, carburetors, lighting devices; Standard Auto Top Company, one-man top; W. H. Waldron, shock absorbers.

## CLEVELAND SALES TOTAL \$1,000,000.

**S**ALES aggregating more than \$1,000,000 are reported to have resulted from the 12th annual automobile show, held in the Wigmore Coliseum, Cleveland, O., Jan. 10-17, under the auspices of the Cleveland Automobile Show Company, and the personal direction of Fred H. Caley as manager. He was assisted by the following officers: President, H. M. Adams; vice president, W. H. Barger; secretary, Fred C. Wood, and treasurer, C. M. Brockway.

In every respect the display exceeded all past records. The number of exhibitors was by far larger than at any previous exhibition, the floor space at the disposal of the management being very nearly an acre and a half. The attendance for the week was about 100,000 and the number of sales, with the sum involved, not only sets a new record for Cleveland, but for any city in that section.

There seems to be no doubt as to the imme-



diate future in the district of which Cleveland is the commercial centre. The dealers of that city sold 9000 cars during 1913, and freely predicted, previous to the opening of the show, that the number for 1914 would reach 14,000. The interest created by the exhibition is sufficient to justify a thoroughly optimistic view of the situation.

The visitors to the show entered the building through an arched pergola of columns and lattice work, profusely covered with foliage and flowers. Once inside the main hall it was found that this same treatment had been carried out to make an entirely original and pleasing setting for the cars and accessories, the exhibitors of which included the following:

**Gasoline Pleasure Cars**—Winton Motor Car Company, Winton; Peerless Motor Car Company, Peerless; White Company, White; F. B. Stearns Company, Stearns-Knight; Chandler Motor Car Company, Chandler; W. H. Barger Company, Lozier, Jeffery; Weaver-Twelve-tree Company, Pierce-Arrow, Chalmers; Richardson Motor Car Company, Cole; Auto Sales Company, Reo, Pathfinder; Ford Motor Company, Ford; Stevens-Duryea Company, Stevens-Duryea; V. R. Hall Automobile Company, Cartecar; E. C. Anderson, Grant; Oakland Motor Company, Oakland; A.

R. Davis Company, Studebaker; Ohio Buick Company, Buick; Jackson Motor Sales Company, Jackson; Hamilton Motor Car Company, Chevrolet, Allen; Lucas & Christensen, Mitchell, Paige; Neighbors Motor Company, Hupmobile; Parrish Motor Car Company, Packard; C. D. Paxson, Crescent; Velle Motor Car Company, Velle, King; Overland-Garford Sales Company, Overland, Willys-Knight; Vulcan Manufacturing Company, Vulcan; Cleveland Cadillac Company, Cadillac; M. D. Coate, Detroit; Pullman; J. H. Greenwald, Hudson.

**Electric Pleasure Cars**—Baker Electric Vehicle Company, Baker; Rauch & Lang Carriage Company, Rauch & Lang; Broc Electric Vehicle Company, Broc; Anderson Electric Car Company, Detroit; Homer Haupt, Ohio.

**Commercial Cars**—Standard Motor Truck Company, Standard; C. D. Paxson, Cleveland, Gabriele; Overland-Garford Sales Company, Garford, Willys Utility; Colonial Service Station, Menominee; Kelly-Springfield Motor Truck Company, Kelly.

**Cyclecars**—Wilkinson, the Cyclecar Man, Imp; J. H. Sizelan Company, Fidelity.

**Accessories**—Euclid Oil Company, H. W. Johns-Manville Company, Joseph Schaeffers, Auto Top Dyeing & Cleaning Company, Visco Motor Oils Company, R. C. Hull Electric Company, Electric Products Company, Universal Lubricating Company, Chas. E. Miller, Cleveland Worm & Gear Company, National Refining Company, Perfection Spring Company, Aetha Life Insurance Company, V-Ray Company, Standard Oil Company of Ohio, Wayne Oil Tank & Pump Company, MacAdams Company, Browning, King Company, City Auto Tire & Supply Company, Favorite Knitting Mills, Cleveland Prest-O-Seal Company, Cleveland Spring Company, O-Tak-A Tire Remover Company, E. H. Bryant, I. H. Silby, Casino Cycle & Supply Company, Factory Sales Company, Scarborough Company, Forest City Electric Company.

## MILWAUKEE ALSO FEATURED TRUCKS.

OF THE 79 different makes of automobiles represented by the 54 dealers in Milwaukee, Wis., 72 were displayed at the sixth annual Milwaukee automobile show in the Auditorium in that city, Jan. 10-16. Not only was this the largest exhibition of motor vehicles ever held in that centre, but the event was made even more notable from the fact that it presented the greatest number of commercial cars ever assembled under one roof in that city.

The situation in Milwaukee is somewhat distinctive, in that a majority of the dealers are state distributors, and therefore in direct touch with the conditions prevailing throughout the whole of Wisconsin. Good crops were responsible for a good year's business during 1913, the sales being decidedly in excess of those for the previous year. Another feature, and by no means the least important, lies in the fact that cash sales were much more frequent than at any time in the past. The dealers have not found it necessary to adopt stringent methods in order to bring this about, since there has been much less disposition to ask for credit.

Concerning the show it may be stated that the results were quite up to expectations. The attendance was large and representative of the entire state, the total being about 40,000, nearly half of whom were non-residents. This was due

in part to the fact that many conventions of dealers, supply men and owners were held during the week. Chairman Edwards of the show committee took full advantage of the opportunity to exploit the commercial vehicles on display, and business men were not only invited, but urged to attend and inspect the various models. Special efforts were made to reach municipal authorities, and the city officials of more than 50 towns and cities in Wisconsin were entertained by a committee created for that purpose.

The interior of the building was transformed into a Japanese garden and the cars were presented amid a veritable bower of flowers, bamboo poles and Japanese lanterns. The list of exhibitors included the following:

**Gasoline Pleasure Cars**—Frint Motor Sales Company, Chevrolet; Hoppe Hatter Motor Car Company, Chalmers; Wollaeger Sales Company, Studebaker, Peerless; Imperial Auto Sales Company, Imperial, K-R-I-T; Hickman-Lauson-Diener Company, Ford; Hughes Motor Car Company, Apperson, National; Winton Motor Car Company, Winton; McDonald Motor Car Company, Lozier; Hustis Bros., Stevens-Duryea, Premier; Sanger Auto Company, Franklin; Buick Motor Company, Buick; Schreiber-Bourse Motor Car Company, Locomobile, Hudson; Emil Estberg, Pope-Hartford; White Automobile Company, White; American Automobile Company, Pierce-Arrow; Schilol Motor Sales Company, Mercar; Cole Motor Company, Cole; Mitchell Automobile Company, Mitchell, Detroit; Creek Motor Sales Company, Oakland, King; Jesse A. Smith Automobile Company, Empire, Speedwell; Regal Auto Sales Company, Regal; Cartecar-Wisconsin Company, Cartecar; R. D. Rockstead, Paige, Chandler; Curtis Auto Company, Reo; Adams & Burg.



Auburn; J. I. Case Threshing Machine Company, Case; Jonas Automobile Company, Cadillac; Sherman Garage, Jackson; Reeke-Osmond Motor Car Company, Jeffery; KisselKar Company, KisselKar; George W. Browne, Overland, Stutz, Willys-Knight; Haynes Automobile Company, Haynes; Packard Motor Car Company, Packard; Edgar F. Sanger Company, Hupmobile, Abbott-Detroit, Stearns-Knight; Milwaukee Auto Sales Company, Maxwell; First Avenue Garage, Davis, Flyer, Metz; C. M. Thorning, Velle; W. C. Walt, Patterson, Moline-Knight.

**Electric Pleasure Cars**—Hoppe Hatter Motor Car Company, Rauch & Lang; McDonald Motor Car Company, Ohio; Emil Estburg, Woods; Jesse A. Smith Automobile Company, Detroit; Baker Electric Agency, Baker; A. H. Esbenshade, Waverley; Hustis Bros., Chicago.

**Steam Pleasure Cars**—J. C. Coxe Company, Stanley.

**Cyclecars**—Cyclecar Sales Company, Imp; Anger Engineering Company, A. E. C.; First Avenue Garage, Billiken.

**Commercial Cars**—Creek Motor Sales Company, Federal; George W. Browne, Garford, Willys Utility; McDonald Motor Car Company, Koehler; Wollaefer Sales Company, Studebaker; Chase Motor Truck Company, Chase; KisselKar Company, KisselKar; Theo. C. Hollnagel,

Menominee; Buick Motor Company, Buick; Crown Commercial Car Company, Crown; Reeke-Osmond Motor Company, Jeffery; American Automobile Company, Pierce-Arrow; Stegeman Motor Car Company, Stegeman; Jesse A. Smith Automobile Company, Universal; White Automobile Company, White; Packard Motor Car Company, Packard; Sternberg Manufacturing Company, Sternberg; Knox Automobile Company, Knox-Martin tractor.

**Motorcycles**—Milwaukee Cycle Supply & Sales Company, Flying Merkel, Thor, Henderson, De Luxe; Harley-Davidson Motor Company, Harley-Davidson.

**Accessories**—Babcock Automobile Spring Company, Western Motor Supply Company, Auto Supply Company, Ph. Gross Hardware Company, H. W. Johns-Manville Company, H. L. Hadden Company, O'Neill Oil & Paint Company, Western Fixture Company, Bartles-Maguire Oil Company, Kamice Company, Christiansen Engineering Company, Wisconsin Mat Company, Robinson Auto Heater Company, Wallmann Manufacturing Company, Wadhams Oil Company, Julius Andrae & Sons Company, Racine Sales Company, Stenz Electric Company, Wisconsin Machine & Manufacturing Company, and representatives of the Boston Ford starter, Air Friction carburetor and Dayton Airless tires.

## ENTERS AUTOMOBILE FIELD.

### Wetmore-Savage Company Places C. F. Lawton in Charge as Manager.

The Wetmore-Savage Company, 76-78 Pearl street, Boston, Mass., one of the largest and most progressive electrical supply houses in that centre, has joined the ranks of the old established concerns entering the automobile field. Recently the company enlarged its automobile department, and it expects to play a prominent part in the supply business in New England.

C. F. Lawton, formerly sales manager of the Bi-Motor Equipment Company, has been placed in charge of the enlarged department as manager, and active work of covering the territory is now under way. Mr. Lawton is perhaps one of the best known and most popular automobile supply salesmen in New England, and his personal following is very large. He was for five years with the Bi-Motor company, first as travelling salesman and later as sales manager.

## KETCHUM SUCCEEDS PRUDEN.

### Former Garford Salesman Takes Charge of KisselKar New England Branch.

The motorists of New England have been somewhat interested in learning the name of the man who was to succeed H. B. Pruden, who resigned as manager of the KisselKar New England branch, Boston, a month or two ago. The Kissel Motor Car Company, Hartford, Wis., has announced the appointment of Ralph Ketchum, one of the best known and most competent salesmen in the East.

During his connection with the R. & L. Com-

pany of Boston, New England distributor for the Garford line, Mr. Ketchum has won for himself an enviable reputation both as an authority and as a salesman. He is one of the new school of executives who believe that the head of a concern should be on the floor or on the road, rather than at a desk.

He takes over the KisselKar branch with every advantage in his favor. Mr. Pruden had provided one of the most complete and attractive sales and service stations in the country on Commonwealth avenue, and a good representation of sub-agencies throughout the New England states.

## REDUCE TIRE GUARANTEE.

### Makers of Equipment for Commercial Vehicles Announce Change in Mileage.

The Goodyear Tire & Rubber Company and the B. F. Goodrich Company of Akron, O., and the United States Tire Company and the Kelly-Springfield Tire Company of New York City, have announced a reduction in the mileage guarantee heretofore supplied with the tires produced by them for use on commercial vehicles. The old guarantee will apply to all tires sold previous to Jan. 1, and allowances will be made accordingly.

The Goodyear and United States tires for gasoline cars formerly bore a guarantee of 10,000 miles service, and this has been reduced to 7000, to be used in 12 months. Electric vehicle tires made by these concerns are now guaranteed for 7000 miles in 18 months. This applies to practically all types of solid tires, although the mileage with some of these has been 7000. The Goodrich reduction is from 8000 to 7000 on both gasoline and electric.



## NATIONAL ENTERS SIX-CYLINDER FIELD.

**T**HE six-cylinder car has received the indorsement of another old established manufacturer, the National Motor Vehicle Company, Indianapolis, Ind., announcing a new chassis which differs in many respects from the well known model 40, which has so ably represented the company in track and road contests. The last named will be continued and will doubtless be the chief factor in the company's production plans for the future.

The new motor has conventional cylinder dimensions of 3.75-inch bore and 5.5-inch stroke, and like the majority of new sixes its cylinders are cast en bloc. It is of the L head type with the valves located on the right, differing from the model 40, which is a T head design with two camshafts. A radical departure from National practise is the utilization of a cantilever type of rear spring, somewhat similar to the Lanchester suspension, but differing, in that the entire end thrust of the car is taken through the springs. This is probably the first endeavor to use a cantilever spring as the propulsive member. The National cantilever springs are 53 inches long and are suspended at the front end from a double shackle.

### New Body Designs.

The body designs are innovations for the National company, being noticeable for their exceptional sweep and cleanliness. They are typical streamline, the hood tapering from the radiator back without a break, and seemingly beginning as far back as the front seat. The impression one receives is that of speed, as wind resistance is reduced to a minimum. The accompanying illus-

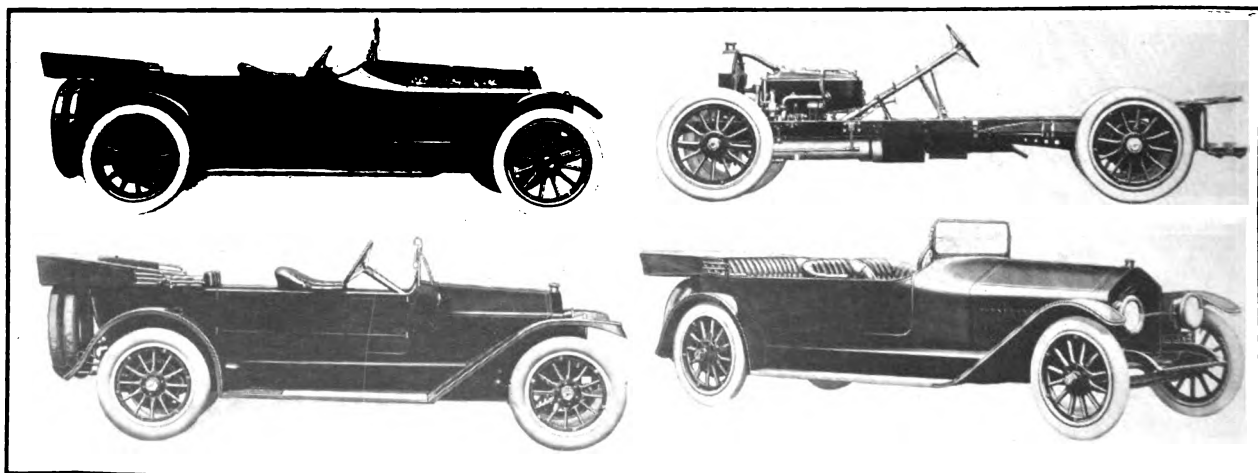
trations bring out these features, also the low centre of gravity.

In its selling policy, as well as mechanical features, the National company has adopted a rather unusual method. It is the belief of the general manager, George M. Dickson, that the prospective purchaser is more vitally concerned in the character of the maker and the responsibility than with many minor details; that is, it is sufficient to show the buyer that the factory has the kind of a car he wants, and the responsibility of the company and the good judgment of its engineers may be relied upon to provide the proper material and incorporate high grade workmanship in carrying out their designs. His idea is that buying a motor car is much like purchasing a high grade watch—the maker's name is sufficient guarantee of its proper material and design.

### Intake Manifold Water Jacketed.

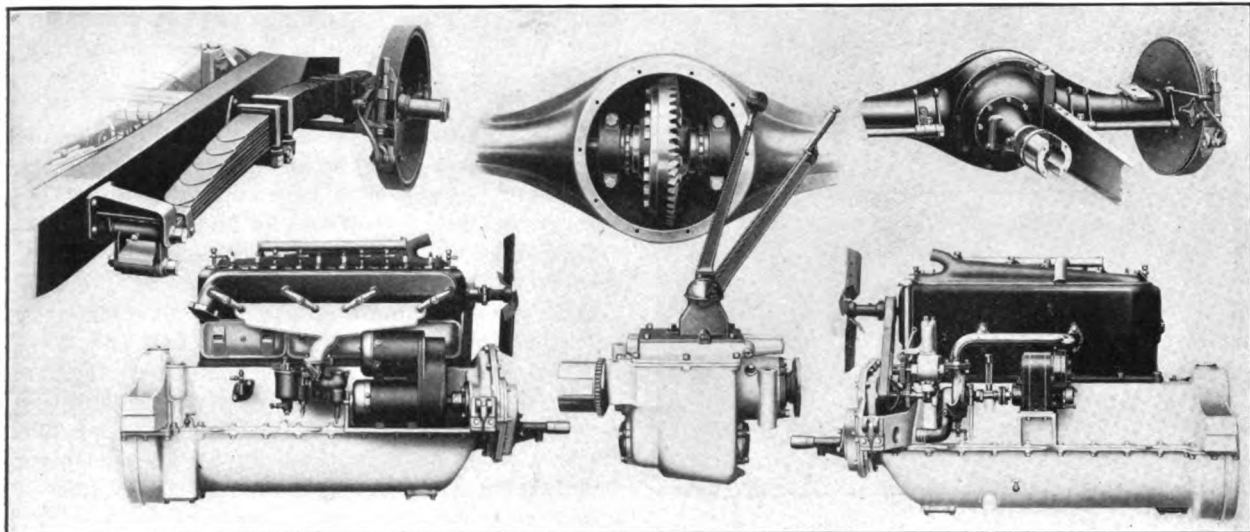
The rating of the motor is 33.75 horsepower by the S. A. E. formula, but it is very conservative when its light weight and long stroke are taken into consideration. A feature of the design is the use of detachable intake and exhaust manifolds and intake water header. The intake water manifold is water jacketed, a distinct advantage in carburetion, and the exhaust is a square, clean casting. The power plant is noticeable for its clean appearance and compactness of design.

A number of noteworthy features are noted in the cooling system. The radiator has been improved, being made more efficient to permit of the use of a smaller design and to conform to the slope of the hood. It is mounted on trunnions on



The Body Designs Fitted to the National Six Chassis Exemplify the Streamline Effect to a Marked Degree.





**Illustrating Some of the Mechanical Features of the National Six, Including Form of Cantilever Spring, Accessible Differential, and Both Sides of Motor, Which Is Noticeable for Its Clean Appearance.**

the frame horns, to compensate for road inequalities, and cooling is aided by an adjustable ball bearing fan mounted on a standard from the engine base.

The cooling fluid is circulated by a rotary pump on a lay shaft driven from the timing gears, which are spiral cut and operate in a bath of oil. The shaft referred to carries from the front to the rear of the motor a fan belt pulley, power tire pump, water pump and magneto. The last named is driven through a leather flexible coupling.

#### **Lighting and Starting Units.**

The crankcase is divided horizontally, and a constant level of lubricant is maintained by a force feed pump, with a splash lubrication of the connecting rods and other cylinder components. The main bearings are lubricated through tubes cored in the cylinder castings, and these tubes also convey oil to the timing gears located at the front end of the motor. This arrangement provides proper lubrication of the silent chain, which drives the starting and lighting units. The last named, although separate, are mounted as a unit upon the valve side of the motor, a base plate being cast on the upper crankcase. One of the noticeable features of the design is the ease with which the dynamo and motor may be displaced if desired. The motor starter is actuated by a foot plunger.

Ignition is by a dual high-tension magneto with a storage battery supplying auxiliary current. A Rayfield carburetor and pressure feed are employed, the fuel container having a capacity of 23 gallons and being suspended at the rear of the chassis. It is well protected, has an am-

ple sized filler tube, and the usual gauge is provided. Pressure is maintained by a small piston pump operated by a cam on the camshaft.

#### **Accessible Clutch.**

One of the qualities of the National clutch is that it is removable without disturbing the balance of the transmission system. This desirable feature is obtained by one of the time tried National constructions, the use of a double universal joint in the short shaft between the clutch and the gearset. The clutch proper is an aluminum, leather faced member, spring cushioned to obtain easy and gradual engagement. Another feature is the use of an adjustable clutch pedal. Easy change of speeds is assured by the use of a clutch brake, comprising two rim bearing pads.

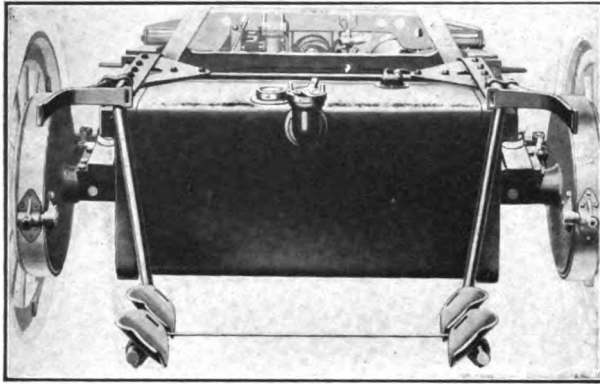
The gearset follows National practise, three forward speeds and a reverse being afforded, and is located amidships. An unenclosed shaft with a universal joint at either end transmits the energy of the motor to a full floating rear axle, and a large torque arm cares for any twisting stresses.

#### **Ample Sized Brakes.**

As in the past, the National braking system provides a large factor of safety. Two sets are fitted, two internal expanding on the hubs, and two external contracting on the outside of the drums, which are 11 inches in diameter and have ample face. The frame of the new chassis is unusually sturdy, having a five-inch channel section and exceptionally wide flanges. It curves up slightly over the rear axle, providing a low suspension of the body, and is offset at the front to permit of turning the machine in a small circle. It is stated that the National six can be turned around in a 39-foot circle.



The front axle is of the conventional I beam section type and supports semi-elliptic springs. The roller bearings of the front wheels are am-



**National Method of Suspending Fuel Tank and Carrying Spare Tires.**

ple in size and are of the adjustable type. Roller bearings are also employed in the rear axle. The driver is located at the left and the steering column is set at a comfortable angle, a feature of the National cars. The control levers are placed in the centre, well back toward the seat, and the gearset member is provided with the ball top, which conforms to the shape of the hand.

The wheelbase is 132 inches, and the 36 by 4.5-inch tires are fitted to Firestone demountable rims, one extra member being standard equipment. Provision is made for carrying two spares at the rear of the chassis, the holders being substantial and the design preventing chafing of the casings.

#### **Control Units Neatly Grouped.**

The control units are neatly and compactly grouped on the instrument board, all being within a metal plate. The push button operating the electric horn is located on the top of the steering column, a position making for convenience as well as quick operation. The equipment leaves nothing to be desired. The Warner speedometer is driven from a gear on the universal at the forward end of the propeller shaft, the pinion bracket being bolted to a cross member of the frame.

In carrying out the streamline body design, the side lamps have been eliminated. The headlights are provided with double bulbs, the smaller lamps being utilized for operation in cities and towns where the ordinances prohibit the use of

headlights. The top includes side curtains and boot, and the windshield is a rain vision and ventilating design.

#### **Three Body Types.**

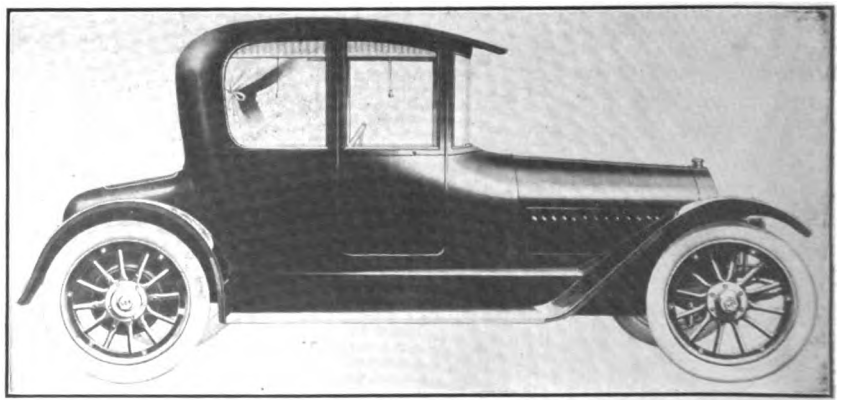
The bodies fitted to the National six include four and five-passenger touring types and a three-passenger coupe. The last named is indicative of the streamline ideas of the National body designer, and has not only the sloping hood, but also is curved with sweeping lines at the rear and top. The mud guards are exceptionally wide, are perfectly smooth and flat and have neither doming nor beading. The new National design is fully in keeping with the high grade established by the model 40 and will appeal to those who desire a machine having ample power to meet the requirements of all conditions of service and comfortable riding qualities.

#### **PLAN TO REORGANIZE.**

#### **Stockholders of Columbus Buggy Company Hold Meeting for This Purpose.**

In a statement signed by L. M. Browne, for the automobile department of the Columbus Buggy Company, Columbus, O., it is announced that a meeting of the owners of this concern was held at the factory Jan. 16, the larger interests being particularly well represented. It was decided to incorporate, issue stock to the present owners for their respective holdings and proceed with the business.

A sub-committee was appointed to act with the creditors' committee, which has been operating the plant since June 7, to carry into effect the plans of incorporation. This committee was



**National Six Coupe, Indicating the Streamline Ideas of the Designer.**

instructed to proceed in the matter as rapidly as possible, and to hold a stockholders' meeting at an early date.



**STEWART-WARNER SERVICE.****Chicago Concern Is Well Represented in This Country and Abroad.**

Service is one of the most important factors for which makers of automobiles and accessories have to provide in order to insure success for their product. The reason for this is held to lie in the fact that the whole car and its equipment, being a collection of machinery, is subject to breakage or excessive wear through accident or improper usage. It is with the idea of still further extending its service facilities that the Stewart-Warner Speedometer Corporation of Chicago announces the establishment of seven new direct factory branches and 50 new service stations, in many parts of the United States and several foreign countries.

With the opening of the new direct factory branches, the Stewart-Warner representatives in 15 cities of the country have equipment and facilities as good as those at the main plants, for taking care of customers. These cities are New York, Boston, Buffalo, Cleveland, Detroit, Indianapolis, Chicago, San Francisco, Philadelphia, Pittsburgh, Atlanta, Los Angeles, Minneapolis, Kansas City and St. Louis. The seven last named are the new ones. The dealers' service stations, which now total 103, are located in every city of any importance as an automobile centre in the world. The United States is thickly dotted with them, and among those in foreign countries are the following: London, Montreal, Quebec, Ottawa, Paris, Sydney, Australia and the Transvaal, South Africa.

**ELIMINATES CHICAGO BRANCH.****Kissel Motor Car Company Turns Business in That Territory Over to Agency.**

Following the announcement that the Peerless Motor Car Company, Cleveland, O., had contracted with the McDuffee Automobile Company of Chicago to handle its product in the future, comes information that the Kissel Motor Car Company, Hartford, Wis., maker of KisselKar pleasure and commercial vehicles, has placed its business in that territory in the same hands, abandoning the Chicago branch. The change went into effect Jan. 20.

Besides these two lines the McDuffee company handles the Howard, made by the Howard Motor Car Company, Connersville, Ind., and the Rauch & Lang electric, made by the Rauch &

Lang Carriage Company, Cleveland, O. The concern is one of the most aggressive in the Middle West.

**TO MAKE QUALITY TIRES.****Akron and Canton Men Organize and Locate Factory in Hartville, O.**

The Quality Tire & Rubber Company has been organized by several men in Akron and Canton, O., and the plant will be located in Hartville, O. The company, which is capitalized for \$75,000, purposes to make tires and tubes of all kinds, and hopes to have its factory in operation next month.

The officers of the company are: President, J. C. Guthrie, Akron; vice president, E. A. Brown, Akron; secretary, E. B. Brown, Akron; treasurer, Edward L. Smith, Canton. F. H. Trump will be factory superintendent.

**CYCLECAR MAKERS WILL ORGANIZE.****Representatives of the Various Manufacturers to Meet During Chicago Show.**

During the week of the Chicago show, Jan. 24-31, there will be a meeting in that city of representatives of the various cyclecar manufacturers throughout the country for the organization of the National Cyclecar Manufacturers' Association. It is stated that invitations have been issued to some 100 concerns who are engaged in the production of the new type of vehicle and it is proposed to organize for mutual benefit.

Simultaneously with this meeting there will be held a convention of delegates representing the various cyclecar clubs, which have been formed during the past few months.

The Department of Commerce, Washington, is announcing the publication of a newspaper directory containing a list of news and trade papers in foreign countries, supplemented with such data as would interest advertisers, possible subscribers, etc. This is known as "Miscellaneous Series No. 10, Foreign Publications for Advertising American Goods, Etc.", and copies will be sold by the superintendent of documents, government printing office, Washington, D. C.

It is stated that the attempt to reorganize the Nyberg Automobile Works, Anderson, Ind., has been abandoned and the plant will now be sold.



## GENERAL NEWS OF THE INDUSTRY.

### American Electric Car Company Organizes to Market Argo, Borland and Broc Pleasure and Commercial Vehicles---Other New Concerns in the Field.

**I**NFORMATION from Chicago reveals the formation of a big electric car combination, under the terms of which the product of the Argo Electric Vehicle Company, Saginaw, Mich., the Borland-Grannis Company, Chicago, and the Broc Electric Vehicle Company, Cleveland, O., will be marketed by the American Electric Car Company of Chicago. The new concern is capitalized for \$1,500,000, and the officers are: President, F. A. Brand; vice presidents, Fred Buck, Bruce Borland and U. B. Grannis; secretary-treasurer, Theodore Huss. Each of the three constituent companies is represented on the executive board and on the board of directors.

The details of the plan have not been made public sufficiently to determine definitely whether the new concern is to take over the manufacturing of the cars heretofore produced by the makers of the Argo, Borland and Broc electric pleasure and commercial vehicles. It is stated, however, that the three names will be retained, and, presumably, the various models will be continued, at least for the present.

As announced recently, there will be three Argo pleasure car models for 1914, six Borland models and six bearing the Broc name. In addition there are two Argo commercial vehicles, and it has been rumored that there is the possibility of electric trucks being produced by the Borland concern.

#### NEW AXLE COMPANY.

#### M. L. Yuster Organizes Concern for This Purpose in Cleveland, O.

M. L. Yuster, formerly general manager of the Hess Spring Axle Company, Cincinnati, O., has been instrumental in the formation of the Yuster Axle Company in Cleveland, O., for the manufacture of axles for pleasure and commercial cars. The concern is understood to have acquired the old Royal Tourist plant, and work is said to have been begun on the installation of modern manufacturing equipment throughout.

The men who are associated with Mr. Yuster in the enterprise are the following: President, W. R. Hopkins of the Cleveland Short Line Railway Company and Cleveland Underground

Rapid Transit Railroad Company; first vice president, E. H. Parkhurst, formerly vice president of the Peerless Motor Car Company; second vice president, E. W. Farr, treasurer of the Perfection Spring Company; assistant general manager and purchasing director, E. E. Muller; engineer, R. E. Fries, formerly with the Weston-Mott Company and the Lozier Motor Company. Mr. Yuster is secretary and general manager.

#### K-R-I-T SALES COMPANY.

#### Maker of K-R-I-T to Secure Additional Working Capital by This Method.

Announcement is made from Detroit that the board of directors of the K-R-I-T Motor Car Company has considered it advisable to secure, in addition to its present quick assets in material, a working capital of \$100,000, through the formation of the K-R-I-T Sales Company. The officials of the new concern are: President, Henry W. Standard; vice president, Walter S. Russell; directors, these two and John J. Ramsey, Albert W. Russell and Frank W. Blair.

As outlined, the plan is for this new concern to purchase materials and pay for the labor entering into the construction of cars, all profits from the sale of machines to go to the K-R-I-T Motor Car Company, except for reimbursing the sales company for its capital invested with interest at six per cent. The old company is said to have contracts and specific orders for cars now in hand sufficient to tax its productive ability to the utmost capacity.

#### WIZARD COMPANY REORGANIZED.

#### Manufacturer of Motors to Produce a Line of Pleasure Cars as Well.

The Wizard Motor Company, Indianapolis, Ind., which has been engaged in the production of motors for some time, has been reorganized with capital of \$50,000, and it is stated that it will add the production of pleasure vehicles.

The principal stockholders of the new company are P. S. Florea, O. C. Forbes and E. H. Habig, who comprise the board of directors.



**POPE SALES FOR DECEMBER.****Receiver Files Report with Superior Court Showing Receipts and Expenses.**

Col. George Pope, as receiver for the Pope Manufacturing Company, Hartford, Conn., has filed with the clerk of the superior court a statement of the business done by him during the month of December. The detailed figures show the following:

|  |                  |
|--|------------------|
| Balance in bank and cash in office, Nov. 29....  | \$85,404.32      |
| <b>Cash Receipts.</b>  |                  |
| Sale of Hartford factory product....   | \$35,899.62      |
| Sale of machinery and tools.....   | 2,509.00         |
| Collections of Hartford factory, accounts and notes receivable of Pope Manufacturing Company.... | 17,178.76        |
| Deposits from customers on orders taken by receiver for automobiles                              | 400.00           |
|  | <u>55,987.38</u> |
|  | \$141,391.70     |

|   |                   |
|---|-------------------|
| <b>Cash Disbursements.</b>  |                   |
| Premiums for insurance on Hartford factory .....  | \$358.01          |
| Refunds of deposits received on undelivered orders .....  | 31.20             |
| Factory payrolls .....  | 19,337.72         |
| Office salaries .....   | 6,602.25          |
| Material, supplies and freight....  | 4,778.61          |
| Miscellaneous expense, selling and advertising .....  | 2,576.54          |
| Expert accountant, West works....   | 300.00            |
| Paid receiver on account of fees....  | 846.77            |
| Discounts made for account, Westfield factory .....   | 468.93            |
|   | <u>35,300.03</u>  |
| Balance in Phoenix National Bank, Dec. 31.....  | \$104,339.21      |
| Balance cash in office, Dec. 31.....  | 1,752.46          |
|   | <u>106,091.67</u> |
| Sales made by receiver, Oct. 28 to Dec. 31, inclusive:  |                   |
| Merchandise .....   | \$113,279.83      |
| Machinery .....   | 2,843.25          |
|   | <u>116,123.08</u> |
| Amount of notes and accounts receivable from sales made by receiver, which has not been collected ..... | 56,111.04         |
| Amount of receiver's security payable for Hartford material.....  | \$11,399.37       |
| Amount of receiver's accounts payable for Westfield material.....                                       | 3,921.41          |
|   | <u>15,320.78</u>  |

**CASE ELECTS OFFICERS.****New Names Appear in the List as Result of the Annual Meeting.**

Several changes were made in management of the J. I. Case Threshing Machine Company, Racine, Wis., as a result of the annual meeting. Warren J. Davis, president of the Manufacturers' National Bank, who was recently elected a director, was made treasurer, succeeding F. Lee Norton, who has held the position since the death of C. J. McIntosh.

The other officers elected are: President, Frank K. Bull; first vice president and general

manager, F. Lee Norton; second vice president, Frederick Robinson; secretary, Richard T. Robinson; assistant secretaries, Stephen Bull and William F. Sawyer; assistant treasurers, R. P. Howell and C. J. Fahrney.

**TO MAKE DILE CAR.****Company Organized to Produce New Machine in Factory at Reading, Penn.**

Announcement is made of the formation of the Dile Motor Car Company of Reading, Penn., with capital of \$20,000. Frank K. Dick, Margaret K. Dick and Irwin D. Lengel are named as the incorporators.

It is stated that a new factory is to be erected in Reading and that production work will be begun about March 1, giving employment to some 150 men. The Dile car is to be a two-passenger roadster, the first model of which is now being constructed, and will sell for less than \$500.

**S. & M. BECOMES BENHAM.****Former Company Retires and Cars Will Be Produced by the Latter Concern.**

Some few months ago announcement was made of the organization of the S. & M. Motor Car Company of Detroit, for the production of a new six-cylinder machine to be known as the S. & M. A dispatch from Detroit states that these cars were assembled in the factory of the Benham Manufacturing Company, which has also been engaged in the production of steering wheels and windshields for the Ford car.

It is further stated that the S. & M. company has retired from the field, and that the Benham company, as a creditor, has taken over the production end of the business. It is understood that this does not mean that the former concern has been purchased, but it is added that the S. & M. cars will continue to be produced under the name of Benham and that between 300 and 500 machines will be marketed during the coming year.

**TESTING ELECTRIC WAGON.****Wagenhals Motor Company Working on Three-Wheel Machine of This Type.**

According to a dispatch from Detroit, the Wagenhals Motor Company of that city is testing a new electric commercial vehicle, which is entirely new in its constructional details. The



company is well known as manufacturer of the Wagenhals gasoline wagon, a three-wheel machine with rated capacity of 800 pounds.

It is understood that the new car will present much the same characteristics as the gasoline vehicle. It will utilize a General Electric motor and a 24-cell Exide storage battery. The carrying capacity is to be the same as the older model, and the price about \$100 more.

### MAXWELL RE-ENTERS RACING.

#### Ray Harroun to Superintend Construction of Three Cars for Contest Work.

Ray Harroun, who won the first international sweepstakes, or 500-mile race, on the Indianapolis speedway in 1911 with a Marmon car, has been engaged by the Maxwell Motor Company, Detroit, for the construction of three cars, which will be entered in this year's 500-mile race, Memorial Day. This statement is of particular interest because of the withdrawal of Maxwell cars from racing events by the management of the old United States Motor Company early in 1912.

It is understood that the speedway cars will have four-cylinder motors with 4.2-inch bore and eight-inch stroke, giving them a piston displacement of 443.32 cubic inches. It is stated that Harroun's contract calls for a speed of 1:37 for a lap of the Indianapolis speedway, which is equivalent to a speed of 92.5 miles an hour. Harroun is to have charge of the racing team, which will take part in other events throughout the year, but will not drive.

### NEW TRADE ORGANIZATION.

#### Nine Manufacturers Form Nucleus of National Accessory Association.

During the closing hours of the New York show, nine accessory manufacturers formed the nucleus of what is hoped will be a national organization of those engaged in the automobile accessory trade, under the name of the Accessories' Co-Operative Association. Apparently, membership is to be limited to manufacturers, and the objects are to be: To promulgate plans for the betterment of trade conditions, to bring the members together, to correct abuses, to permit an interchange of ideas, etc.

The officers and directors are: President, Lewis H. Shalock, M. & S. Gear Company, Kansas City, Mo.; secretary, N. L. Shaten, Standard

Motor Parts Manufacturing Company, 1200 Chestnut street, Philadelphia; directors, John F. Renfro, Peteler Shock Absorber Company, New York City; William C. Reynolds, Para Tire Company, New York City; Perry M. Powers, Powers Shock Absorber Company, New York City; C. J. Cadwell, Master Carburetor Company, Los Angeles, Cal.; A. E. Roberts, S. & A. Manufacturing Company, Boston, Mass.; A. D. Noonan, A. S. Noonan Tool & Machine Works, Rome, N. Y.; J. W. Beers, Bridgeport, Conn.

### TAKES OVER TWO CONCERNS.

#### Standard Motor Company Completes Organization Plan in Mason City, Ia.

Although it was stated at first that the Standard Motor Company was to be organized for the purpose of taking over the assets of the Colby Motor Company of Mason City, Ia., and the Minneapolis Motor Company, Minneapolis, Minn., with location in the latter city, additional details indicate that the first named company is to be located in Mason City. It is now understood that the Standard company has taken over the Colby Motor Company and the Nevada Manufacturing Company, the latter being maker of a line of motor trucks and tractors.

The officers of the concern are: President, R. C. Plummer, vice president of the First National Bank, Forest City; vice president, George H. Fuller, president, Farmers State Bank, Rockwell; treasurer, Isaac Sweigard, vice president, Farmers National Bank, Garner; secretary, W. T. S. Rath, vice president, State Exchange Bank, Ackley; assistant secretary and treasurer, S. A. Schneider, secretary and treasurer, Mason City Loan Association.

The Invader Oil Company, New York City, through E. A. Scheu, general manager, has concluded arrangements with the James Bailey Company, Portland, Me., which will handle the products of that concern for the State of Maine on an exclusive selling basis during 1914. The company also has made similar arrangements with George Collins, 284 Columbus avenue, Boston, Mass., who will retain its old address at that place and take care of all local business in that section of New England.

The 25 automobile dealers in Waterloo, Ia., are extremely proud of the sales record made by them during 1913, when 3000 cars were delivered from the salesrooms of that city.

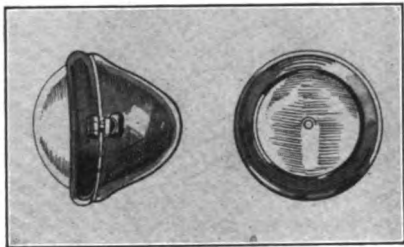


# NEW ACCESSORIES FOR THE MOTORIST.

## NON-BLINDING HEADLIGHT.

### New Gray & Davis Light Has Novel Features.

Gray & Davis, Inc., Boston, has brought out a non-blinding type of headlight which is held to provide a

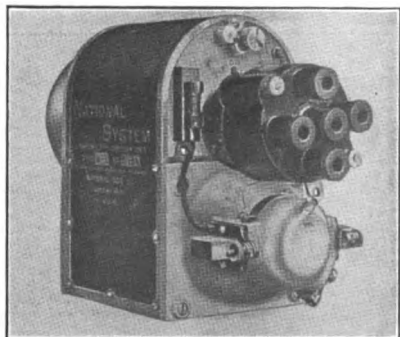


bright beam for distance and a diffused light for the foreground. The latter quality is obtained by the use of a semi-circular, frosted front glass, which is held to be stronger than the usual construction and to diffuse a "fan ray", making the radiator and front wheels plainly visible to an approaching vehicle. With the bulbs lighted and lamps viewed from the front, they have an appearance of a frosted globe glowing with light and showing a relatively small bright spot. The last named provides a long, slender "pencil ray", which is thrown directly on the road far ahead.

## NATIONAL GENERATOR.

### Includes Timing Mechanism for Ignition Purposes.

The National Coil Company, Lansing, Mich., is manufacturing what is termed its type A generator, which is constructed to supply a large output at low motor speeds, and to carry the average lamp load at eight to 10 miles an hour. The output of the lighting dynamo is automatically regulated, and the maker states that overcharging of the battery is prevented at high speeds. One of the qualities of the National is the provision made for increasing the output in cold weather and when the machine is used in city service. Augmenting the output is rendered possible by the changing of a screw plug switch on the front plate of the generator.



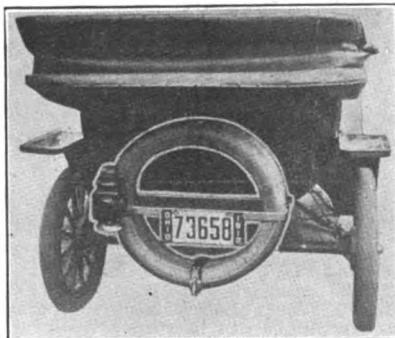
Ignition is provided by the type A generator unit, a synchronized spark being developed by the use of a closed circuit transformer of compact design. The National dash unit comprises an ammeter, reverse current relay, fuse panel, ignition and lighting switches. These are compactly and neatly grouped. The usual dimming feature is included. The company states that its reverse current relay regulates very closely.

## SLY FORD TIRE HOLDER.

### A Combined Lamp, Number Plate and Shoe Support.

Smalley Daniels, Detroit, with offices at New York City and Boston, is marketing the Sly lamp, number plate and tire holder, which is designed for the model T Ford automobile. The maker states that it includes several valuable features not embodied in other designs, in that it combines a number plate holder and lamp bracket, compact tire holder and a thief proof lock.

The tire holder is attached to the rear of the chassis, is of pressed steel black enamelled, and is so formed as



to provide a snug cradle for each tire. It is stated that the design is such as to prevent chafing of the tires. Straps are also eliminated. One of the qualities of the holder is that either tire may be removed in 10 seconds without disturbing the other casing. The lock is a part of the construction. It is stated that the design can be attached in a few minutes and that it improves the appearance of the machine, in that it helps cover the open space below the body.

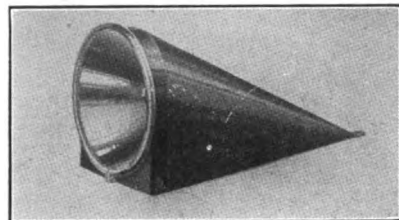
## POWER TIRE PUMPS.

The power tire pump promises to be the most popular new accessory for the used motor car, and already a number of moderately priced pumps have made their appearance. Several makers announce brackets, etc., for simplifying the work of installation, and in the majority of instances the service of the pump is obtained by the meshing of gears. It is only reasonable to assume that some form of cone or disc clutch will ultimately be employed to impart the motor's energy.

## J-M LOBSTER EYE.

### Adjustable Electric Headlight for Fender.

The H. W. Johns-Manville Company, New York City, is marketing the J-M lobster eyes, which are made

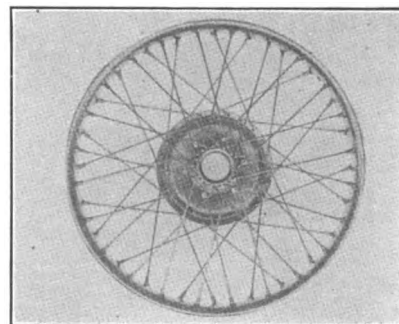


in two styles, these differing in the size of lamps employed. The lobster eyes consist of a lamp fitted with a stamping so that they can be attached to the top of each front fender in line with the radiator. The style C fits loosely in the stamping and can be turned in any position over an arc of 30 degrees so as to throw the light directly in front of the car or at a distance as desired. When the proper adjustment is obtained, the lamp is permanently set by means of a small screw. A six-inch reflector is utilized, and the wires are led through suitable tubing to the lobster eye. All leads are concealed.

## FORD WIRE WHEEL.

### Stanweld Design Bolts to Wheel Flange.

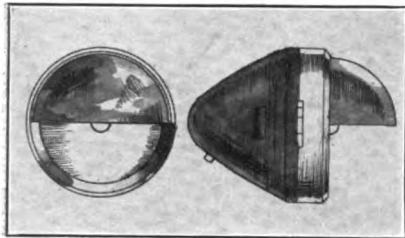
The Standard Welding Company, Cleveland, O., is manufacturing a neat design of wire wheels for attachment to model T Ford cars, and one of the qualities of the design is that it may be applied to both front and rear wheels by utilizing the old wooden wheel flange and bolts. The hub of the Stanweld is a steel stamping, the spokes are reinforced at both ends, and the three-cross method of lacing is employed. The finish is two coats of black enamel, baked on. Among the features emphasized in the wheels is lightness. They come complete for attachment, and their application does not involve any other work than removing the old flange and bolts, and displacing the wooden wheel. Special tools are not required.





**BROWN HEADLIGHT.****Mechanically Controls and Deflects Rays of Light.**

The Brown Company, Syracuse, maker of power tire pumps, has brought out the Brown deflecting

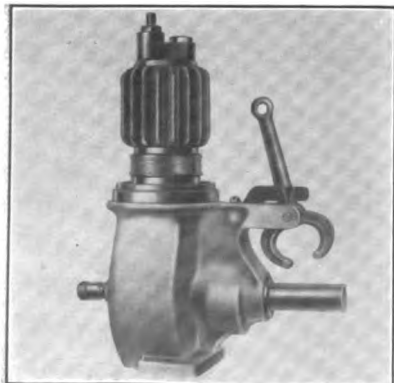


headlight, which, as the name implies, is a device for controlling the light rays and without the usual dimming arrangement. The control is mechanical, the movement of the shutter being obtained by the use of an individual, compact motor. The operating switch may be located as desired. A semi-dome metal deflector or shutter, the drop of which may be regulated, acts on the horizontal and upward rays to the extent of changing their course, forcing a large number of them downward and ahead. This eliminates the glaring effect without sacrificing efficiency and conforms to the ordinances prohibiting the use of blinding headlights.

**STEWART AIR PUMP.****The One-Cylinder Design Having a Clutch, Etc.**

The Stewart-Warner Speedometer Corporation, Chicago, has brought out a new type of one-cylinder pump to meet the demand for a high grade, popular priced unit. It is an air-cooled design and the fins provide ample cooling surface. The air is protected by a double ball valve, insuring operation even if one becomes clogged with dirt, etc. The bore is 1.4375 inches, stroke 2.5. The piston is extra long and is provided with oil conductors, insuring lubrication.

The pump requires no surplus oil in the crankcase, the piston being lubricated by means of a wick system, or wipe, in contact with the piston. Oil is dropped from this wick from the outside of the pump. The bottom of

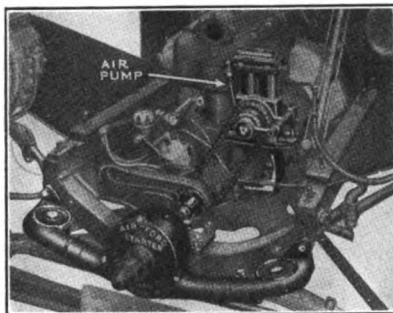


the crankcase is open, so that any free oil drops out. The maker states that it is impossible for any lubricant to be carried with the air into the tires. A clutch, tire gauge and 13 feet of hose with connections are supplied with each pump.

**KELLOGG FORD STARTER.****Spins Crankshaft by Use of Compressed Air.**

The Kellogg Manufacturing Company, Rochester, N. Y., maker of power tire pumps, etc., has brought out a compressed air starting system for the model T Ford car. It comprises in combination a pump and starting mechanism, storage tank, gauge, starter button and pump control. As shown by an accompanying illustration, the installation involves the addition of a small bracket at the front of the car, which does not detract from its appearance.

The unit comprises a cylinder, the piston of which is actuated by air entering from the tank and at high speeds. A chain connected with the piston operates a drum in the housing mounted at the front of the car. This chain makes one complete turn



around the drum. The fan belt pulley is replaced with a combination pulley, sprocket for driving the pump, and a clutch which automatically engages with the motor when the starter is operated. The application of the air is gradual, but the power developed during the balance of the piston travel is such as to spin the motor. A spring returns the drum, preparing for a second application of energy.

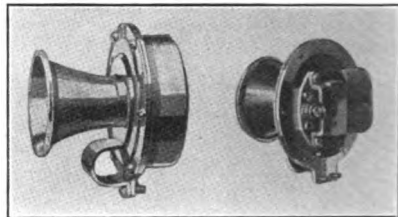
All working parts are fully enclosed, and provision is made for inflating tires. Control of the pump for storing compressed air is by a button, and a similar member operates the starter. Several starts are held to be possible with one charging of the tank.

**GLARELESS LAMPS.**

The announcement of non-blinding lamps by several makers may be held to anticipate legislation prohibiting the use of dazzling headlights in the cities. A number of cities have passed ordinances to this effect and it is very probable that others will enact similar laws. Among the new designs are three eliminating the glare without the unusual dimming feature. One of these is operated by a tiny electric motor. Another uses lenses to control the rays.

**MAXI II HORN.****Compact and Designed Especially for Use with Motorcycles.**

The Dean Electric Company, Elyria, O., which concern markets a number of electric horns, is producing a



new type termed the Maxi II, which is designed especially for motorcycles. It is a popular priced signal; provides a sharp, abrupt, penetrating sound, and it is stated it requires but little current to operate. A special lever type push button is included in the equipment, it being mounted on the handlebar close to the grip. It is of the quick acting type and easily operated. The finish of the Maxi II is baked enamel and the switch is nickel-plated. Suitable length of flexible cord and clips accompany each horn. The company is marketing a battery case which holds two No. 1 flashlight cells, capable of operating the horn for a considerable period. The connections of the case permit of the use of one or both cells as desired.

**EXIDE TYPE X BATTERY.****New Design for Service with Motor Starters.**

The Electric Storage Battery Company, Philadelphia, is producing a new type of battery for service with electric motor starters, termed the Exide type X. It is designed to meet the exacting requirements of starting motors and lighting systems, is very compact and is constructed with the same care characteristic of the product of this concern.

Individual cells are utilized, and these are closed at the top by means of a cover having an inner sealing flange and an outer flange which encloses, supports and protects the top edge of the bar. The maker states that the covers will not catch and retain dirt or water, and that it can be cleaned easily. An important feature is the gas vent and filling aperture, which is so arranged as to limit the amount of water that can be used.

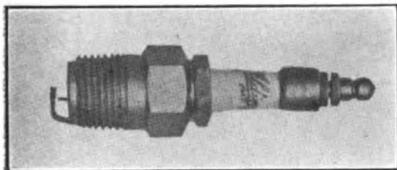




**ALDING SPARK PLUG.**

**Is High Grade, Moderately Priced and Guaranteed.**

The Alsten & Goulding Company, 36 Foster street, Worcester, Mass., is producing a high grade spark plug,



called the Alding, which is marketed at a low price and carries a liberal guarantee. While designed for service with all types of internal combustion engines, it is especially serviceable for the model T Ford motor.

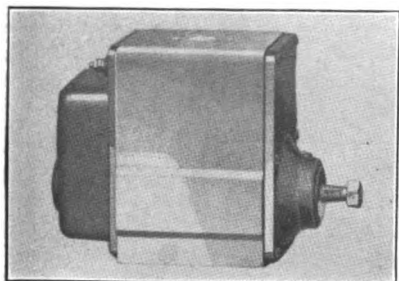
The company states that any motorist purchasing an Alding plug, and not finding it satisfactory, can return same for replacement. The mileage is unlimited. The porcelains utilized in the Alding are made from a secret formula from the best imported clays, and are hand turned. They are constructed to be as nearly heat proof as possible, and any that crack with heat will be replaced free of charge. All parts are interchangeable, and the porcelains are inexpensive. The Alding is made in various threads, and the company is making a very attractive offer to readers of The Automobile Journal.

**ELYRIA-DEAN DYNAMO.**

**Lighting System Adapted to the Small Motor Car.**

The Dean Electric Company, Elyria, O., is manufacturing a dynamo lighting system especially adapted to the small car, which is termed the Elyria-Dean II. The company states that each element is made to do the work most efficiently, cutting down the weight to a minimum, and obviating complications in mounting and wiring. The system was brought out to meet the demand of owners who desire other than a standard equipment and of large output capacity.

The dynamo is very compact and has a self-contained reverse current cut-out, and the equipment includes a combined lighting switch, current indicator and connecting rack, and a 40 ampere-hour capacity storage battery. The dynamo is cut in at 700 revolutions a minute of the armature, and carries all lights dim at 1000 revolutions, and bright at 1400. The



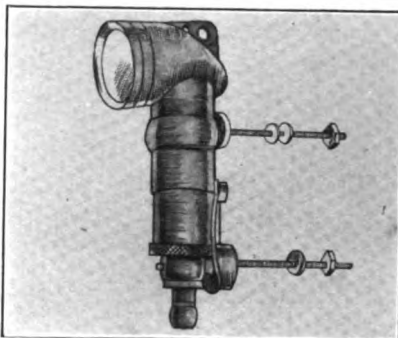
drive ratio of the Elyria-Dean is 2:1.

The output is controlled by a special arrangement of the windings and by a particular design of the magnetic field, a construction which the company states eliminates moving and adjustable parts. The action of the dynamo, as well as the reverse current cut-out, is shown at all times by a special indicator located in the dash switch.

**ROFFY ELECTRIC LAMPS.**

**Eliminate Glare—Are Attached to Radiator.**

The Roffy-Grace Corporation, 1926 Broadway, New York City, is introducing the Roffy lamp, which presents a number of interesting features, among them being the elimination of glaring effects, the inventor stating that the non-blinding quality does not impair the efficiency of the light. The Roffy lamp is not only a neat, compact design, but its light weight permits of installation on the radiator, two .1875-inch bolts being employed. These are inserted between the fins. The company states that the method of locking prevents vibration and that the radiator cannot be damaged by the bolts which retain the lamps in place.



Glare is eliminated in the Roffy design by the use of a conically shaped achromatic light beam with sharply defined edges, so projected that the upper boundary is parallel with the ground. This light is rectified for chromatism, aberration and diffraction, producing an even field of white light. It is stated that the rays will illuminate for about 1.5 city squares, and since the upper edge of the light beam is never more than 4.5 feet from the ground, there is no glare into the eyes of persons on the highway.

The lamp itself is tubular. Located at the bottom of the tube is a mushroom shaped tungsten bulb, above the flattened portion of which is a plano convex condensing lens that collects the rays. Above this lens is a double convex lens, which converges the light beam upwards against a mirror placed at such an angle that the light beam is reflected horizontally through the projection lens.

**It is the intention of the editor of this department to present only the latest accessories. In writing, kindly mention The Automobile Journal.**

**AUTO SIGNALITE.**

**Rear Signalling Device Operated by a Lever.**

The Auto Signalite, made by the Auto Signalite Company, 735 Seventh avenue, New York City, differs from



the conventional types of signalling devices in that a small lever is utilized to operate it. The lever is operated by the driver slightly in anticipation of stopping, turning to the right or left, or continuing in the original direction.

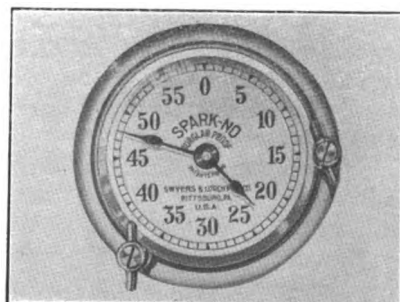
Combined with the signal is a tail light and number plate bracket, these being compactly arranged in a cylinder having dimensions of 5.5 by 12.5 inches. The company states that the installation can be made easily and that the Auto Signalite can be attached to any part of the rear of the vehicle. An electric light illuminates the words, "Stop", "Right", "Left" and the red light.

**SPARK-NO LOCK.**

**An Ingenious Device for Locking the Ignition.**

The Spark-No automobile lock is marketed by the H. W. Johns-Manville Company, New York City, and is an ingenious device for locking the ignition of the motor car and preventing use of the machine by others than those intended. It is attached to the dash, and the hands are moved over a calibrated dial by means of two little knobs. These are used for starting for battery and running for magneto, and one of the qualities is that it is impossible for any one riding with the driver to discover the starting combination.

If anyone attempts to steal the car, not only is the ignition cut out, but an alarm is sounded by a bell. The signal is also sounded if one tampers with the lock. The action of the device is similar to a combination lock, but differs in that the combination operates a switch, and this switch cannot be closed unless the hands are properly set on the dial.





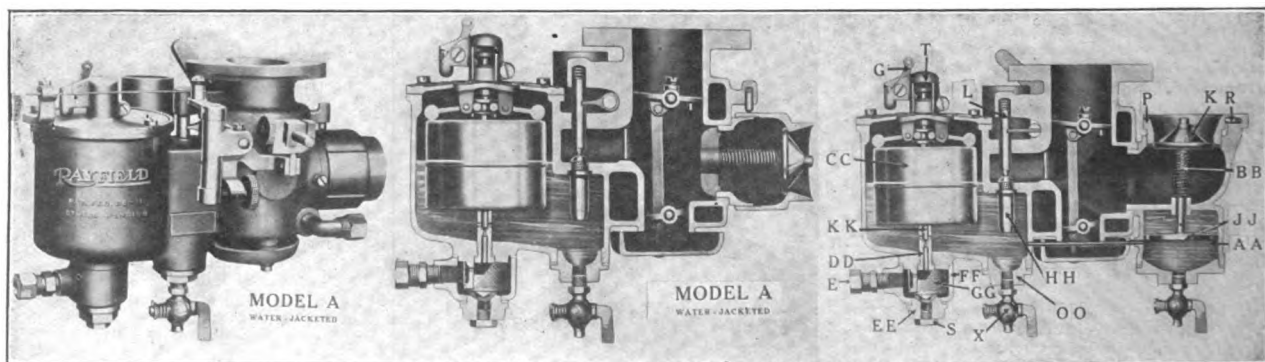
## NEW RAYFIELD HAS MANY IMPROVEMENTS.

THE Findeisen & Kropf Manufacturing Company, Chicago, maker of the well known Rayfield carburetors, has brought out a new design which differs materially from its predecessor, the model D, but the principle remains the same. The new type is known as the model A when water jacketed, and as B without water jackets. These with the dashpot model are shown in an accompanying illustration.

The most noticeable change made is in the float mechanism, a new method of float control having been designed. Instead of a weight on the needle itself in a chamber beside the float, fulcrum levers are utilized directly above the float as indicated in both sectional views. The two fulcrum levers control the needle valve, the stem of which extends through the brass float. As the last named member rises, the arms lift,

speeds, supplying air when called upon by the motor. The maker states that the Rayfield combines the advantages of the mechanical and automatic principle without the disadvantages of either.

Another new product of the company is the dashpot Rayfield, shown at the extreme right in the illustration. It combines the same principles as the other models except for the air control. It is produced in two forms, with a single and double jet, the latter being for service with six-cylinder motors. The air valve stem is integral with the piston and is in a bath of fuel as shown in the illustration. With it a quick opening of the throttle results in a rich mixture being supplied temporarily, for getting away quickly. Fluttering of the auxiliary air valve is prevented by the valve stem being immersed



Three New Models of Rayfield Carburetors, Having Fuel and Air Adjustments Marked, Improved Float Mechanism and Many Refinements Making for Efficiency and Economy—The Type at the Right Has a Dashpot.

and the fuel supply is restricted proportionately to the upward movement. This construction made necessary a change in the fuel inlet, which is now directly below the float chamber.

Another feature of the new design is the fitting of an efficient strainer trap, so constructed that the fuel connection may be turned to simplify installation. A large water and sediment pocket is provided and the conventional draining cock included. The throttle arm stop has a positive locking device, and several little refinements have been made, including the marking of the fuel and air adjustments so that the novice may determine easily the proper rotation of the screw members.

The characteristics emphasized by the Rayfield carburetors are the constant, mechanical and automatic air valves. The fixed supplies air at all speeds, the mechanical works in conjunction with the throttle, and the automatic at varying

in the fuel as has been previously explained.

The double-jet model is similar to the single with the exception of an injector, which extends from the piston chamber to the mixing chamber, and a quick air valve opening causes the piston to exert pressure against the fuel, thereby spraying additional gasoline into the mixing chamber. This condition is only temporary, for upon the air valve assuming its normal position an economical mixture is obtained. The advantage of the dashpot type is that it enables a lean running mixture, with a rich one for rapid acceleration and automatically. The dash adjustment feature, long a quality of the Rayfield, is continued with the new models.

The Austin Motor Car Company, Ltd., Northfield, Birmingham, England, is issuing a neat and attractive calendar, in the form of an Austin car of the latest type.



**ECONOMICAL IN SERVICE.****KisselKar Owner Reports to Chicago Branch After Two Years of Use.**

Prospective motorists are interested in learning the approximate expense of running a car. Recently, T. A. Wanderer of Oak Park, Ill., made report to Manager R. D. Jones of the Chicago branch of the Kissel Motor Car Company, Hartford, Wis., concerning the condition of his machine after 13,000 miles of service. The following extract from his letter also relates the result of a trip from Oak Park to Newark, N. J., and return:

We left Oak Park, a party of four grown people, the tonneau crowded with a few suit cases and a heavy trunk in the rear. The tires already had covered about 7000 miles, and our object in keeping them on was to find out how far they would go under the touring strain. At 7 that night, after retracing the road due to washouts, we arrived at Bryan, O., a distance of 230 miles. After passing Toledo the tires were giving away, and at Buffalo we were entirely reshod. The total mileage for each tire was about 7600, and this speaks very highly for the performance of the car on the tires.

When we reached the mountains in New York we wondered how the engine would perform under the reduced atmospheric pressure. We could not perceive any difference in the power that was given out by the engine, and it was equal to that to which we were accustomed in the State of Illinois. The ride through New York State was a very enjoyable one, far surpassing the comfortable ones that we have on our boulevards. It took us two hours to cross the city of New York on Broadway, and we were glad to get the ferry to New Jersey.

We stayed in Newark about three weeks, and then decided to take the southern route home. This took us through Washington, D. C.; Gettysburg, Pittsburg, Wheeling, Columbus, Indianapolis, Lafayette and Crown Point. The roads from Newark to Washington were very good and extra good scenery was to be had. Throughout Pennsylvania the roads were very poor and the car was given a good test. Mile after mile of poor road, sometimes through forests, up and down mountains, was the rule. The mountain roads had large water breaks built across them. These were worse than the "Thank-you-Marms".

The entire trip covered over 4000 miles, without a single mishap to either the car or the engine. We had just one puncture. The finish and paint stood up very well; no cracking at all. I might mention here that the daily rides, which averaged about 200 miles, were not tiresome a bit.

From the time we got home to Dec. 24, we covered an additional 3000 miles and then decided to investigate the engine. The speedometer reading showed that we had travelled 13,000 miles. We found that besides scraping the cylinders we would have to replace three piston pins and a petcock, the latter being broken in taking the engine apart. The total cost of repairs was \$4.04, the work being performed by us in our leisure time. The piston rings were in good condition.

During the Newark trip we expended \$57 for gasoline and \$10.85 for oil. The total mileage covered was 4000, the amount of gasoline 319 gallons and the speed averaged 13 miles an hour. In Chicago we made over 14 miles to a gallon of gasoline and used very little oil. The tires are of ample size and consequently we can get more mileage at a low cost.

For the first year, not counting depreciation of the car, it cost us nearly four cents a mile. This is for running the car with seven to eight passengers. This is just one-fourth as cheap as using the railroad and paying two cents a mile. Besides we get to see things and have solid comfort. The second year the cost a mile was about 3.5 cents, due to tires being cheaper. As this is our sec-

ond KisselKar, I would state here that we would not want a better car, and will always continue to use them. A good car I think is the cheapest.

**HESS-BRIGHT LITIGATION.****Case Will Be Taken to United States Circuit Court of Appeals.**

It was announced in the last issue that the action of the Hess-Bright Manufacturing Company of Philadelphia and the Deutsche Waffen und Munitions Fabriken of Germany, against Hedwig Fichtel and Ernst Sachs of Germany, doing business as Fichtel & Sachs, and their exclusive American representative, the J. S. Bretz Company of New York, had been decided in favor of the defendants by Judge McPherson in the United States district court in Philadelphia. The action has to do with the alleged infringement of the so-called Conrad patents concerning ball bearings.

In respect to this decision, the Hess-Bright company says that it in no wise affects the relation of the Conrad patent to bearings of the Hess-Bright type, and that the question has already been determined by the same court several times. It adds that the only point involved is whether or not the patent also dominates bearings having a non-full depth filling notch. "The lower court has held in the negative", it says, "but this is simply the first step to a determination by the United States circuit court of appeals, where it will be decided".

**BUSINESS IS GOOD.****Moon Motor Car Company Finds Shipments Have Increased Nearly One-Third.**

That business is good throughout the automobile industry is decidedly evident from the reports made by most of the manufacturers. One of the latest statements in this connection is that made by the Moon Motor Car Company of St. Louis, which produces the Moon cars.

According to this report the gross shipments from the factory during the months of August, September, October, November and December in 1913, amounted to \$237,478.40, as against \$312,005.14 for the same months in 1912, showing an increase of \$74,526.70, or a gain of 31.3 per cent. As these months are regarded in the industry as the dullest period of the year, the gain is substantial, and one which reflects the tendency of the times.



## HINTS FOR NEW CAR OWNERS.

### Detailed Instructions for Cleaning and Adjusting Model A Splitdorf Magnetos, Standard Equipment on Several 1914 Cars---Wiring Diagram of Ford Ignition.

**B**ROADLY speaking, there is little that the owner of a motor car is called upon to do to a magneto other than cleaning the distribu-

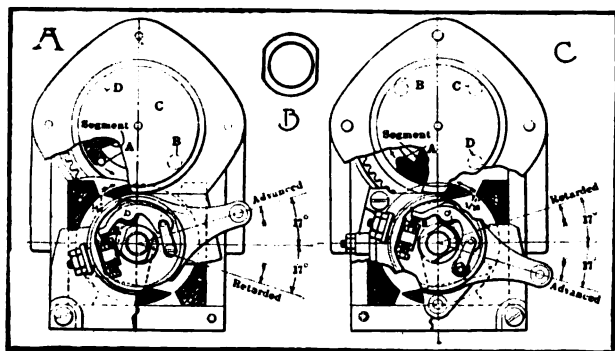


Fig. 1—Illustrating Anti-Clockwise and Clockwise Drive of Model A Splitdorf Magneto, and Proper Relation of Armature Core to Pole Piece When Changing Direction of Rotation: A, Anti-Clockwise; B, Removable Cam; C, Clockwise.

tor and circuit breaker, adjusting the contact points and lubricating. Even this usually is left by the new owner to the expert at the garage or service station, because the magneto is regarded more or less as a mysterious instrument. Such work as may be performed by the owner is easily accomplished, however, provided the principles of a magneto are understood; that is, the construction and operation of the distributor and the circuit breaker.

It is the intention of the writer to present in this department the leading types of magnetos utilized on 1914 models, and to show and explain the construction and operation of those components which may be cleaned and adjusted by the novice.

The model A Splitdorf magneto, made by the Splitdorf Electrical Company, Newark, N. J., which concern manufactures a number of models, including a true high-tension type, is standard equipment on a number of 1914 machines, among which may be named the model 79 Overland car.

#### Armature Winding.

This instrument is of the single-wound armature type; that is, the armature generates a low-tension current, which is transformed into a high-tension by the use of a step-up coil. The Splitdorf model A, as does several other types made by the company, provides dual ignition, and the same set of spark plugs is employed. Current is

supplied in one instance by a set of dry cells or suitable storage battery, and in the other by the instrument itself.

Longitudinal and end views of the magneto are presented at Fig. 3 with the components lettered, and a little study of the parts, as well as a brief description of their operation, will be of service in making adjustments or in the event of trouble upon the road. The writer recalls one particular instance of an owner being delayed upon the road several hours by a simple trouble which could have been remedied in a few minutes had the motorist been familiar with the construction of the circuit breaker housing. He adhered strictly to the instructions of the agent not to touch the magneto, and it required considerable persuasion upon the writer's part before he was allowed to displace the circuit breaker and remedy the trouble.

#### Collector Brush.

Briefly stated, the electricity generated by the instrument is collected by a brush in the circuit breaker cover, which may be easily recognized by the terminal or binding nut. This is denoted in the drawing by the thumb nut. The brush bears against a conducting member, and when there is not proper contact between the brush and the member, the magneto is inoperative; that is, the low-tension current generated cannot flow to the coil.

As with all forms of jump spark ignition, the primary or low-tension current must be interrupted or broken, hence the term interrupter mechanism of the magneto. The arrangement of these components is shown at Fig. 3 and these

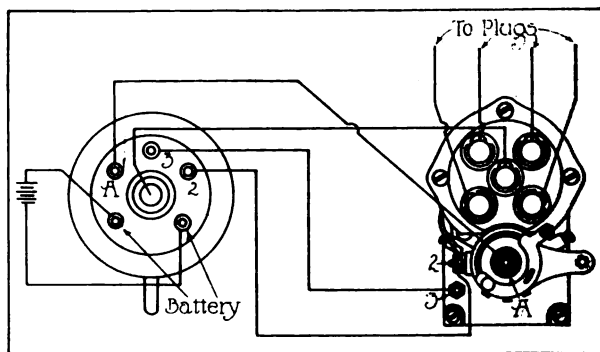


Fig. 2—Wiring Plan of Model A Splitdorf Magneto—Note That Both Leads of Battery Are Attached to Transformer Coll, Not Grounded.



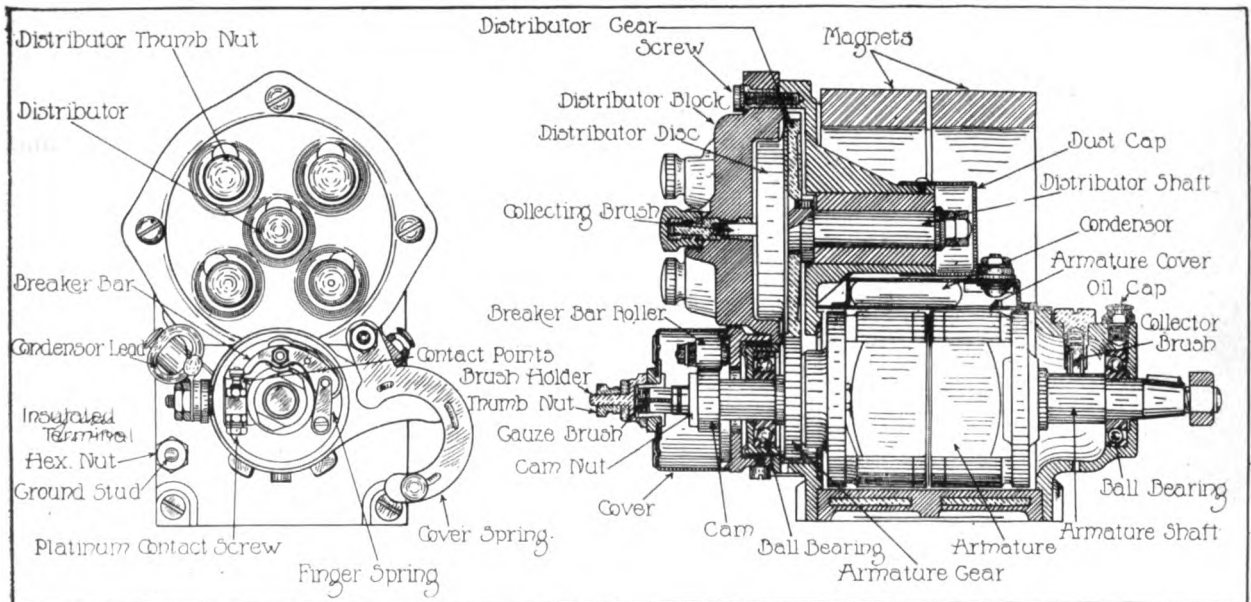
are accessible by loosening the binding nut retaining the cover spring and swinging the last named member downward and to the right. The cover with its thumb nut may be slipped off and the breaker mechanism displaced by pulling the timing lever forward. This will permit of adjusting and cleaning the points. The wire connecting the breaker arm or condenser lead should not be tampered with.

#### Interrupter Mechanism.

The break of the primary current is obtained by a pivotally mounted contact lever carrying a fixed platinum point which is normally held in contact with another platinum point by the tension of a spring. The last named platinum member screws into a block and is prevented from turning by a lock nut. This screw is made ad-

loosen the locking nut of the movable platinum point, using the wrench provided for this work, and screw in the contact screw to reduce the gap, or out to increase it. The space may be determined by the gauge accompanying each wrench. It is possible that the operation of the motor will be improved by deviating slightly from the space above stated, but .03125 inch is generally employed.

Burned or pitted points affect the efficiency of the magneto. To clean, utilize a very fine jeweller's file, and do not remove too much of the platinum. The points should contact evenly. One cannot be too careful in the matter of lubrication. The cam should be oiled sparingly, and the roller of the breaker bar is best lubricated by applying the oil with a toothpick. Lubricate



**Fig. 3—Longitudinal and End Views of Model A Splittdorf Magneto, Outlining Arrangement of Components—The View at the Left Depicts the Circuit Breaker with Cover Spring Swung Outward.**

justable so that the relation of its point with that of the fixed point may be altered to compensate for wear, etc.

The separation of the two platinum points is accomplished by a two-pointed cam secured to the armature shaft, and two breaks are obtained to one revolution of the armature shaft, which rotates at motor crankshaft speed. Consequently the armature makes two complete revolutions, four breaks are obtained and four sparks are secured with the four-cylinder engine.

#### Adjusting Break.

The proper break or distance between the platinum points when fully separated should be .03125 inch and the maximum gap of the spark plugs should be the same. To adjust the break,

once in three months with average service. The oilers proper require a few drops about every thousand miles.

#### Cleaning Distributor.

The distributor housing is displaced by removing three screws. The view at Fig. 3 shows the method of retention, collecting brush, etc., and these components must not be lubricated. If the distributor needs cleaning, use a soft camel's hair brush. Do not attempt to change the tension of the collector brush unless it fails to make contact.

The timing and wiring of a magneto are simple. Assuming that the instrument has been removed or the coupling between the driving shaft and the armature has been displaced, it is neces-



sary to know the firing order of the cylinders, direction of rotation of the armature shaft, and location of the piston of the first cylinder. The last named factor is important and differs according to the make of motor.

#### Timing Magneto.

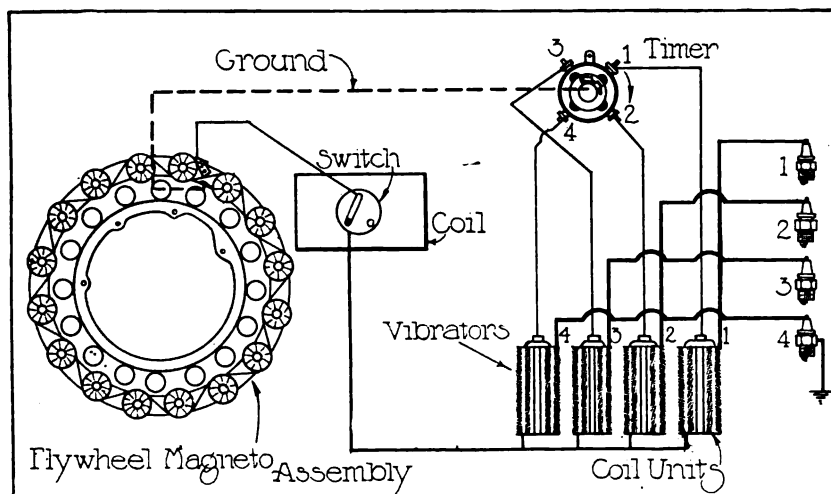
With the model 79 Overland the flywheel is rotated until the piston of the No. 1 cylinder has completed the compression stroke and the flywheel is one inch past the dead centre mark. If the contact points are set with a break of .03125 inch, they will just begin to separate. The coupling is then replaced, and care must be taken not to rotate the armature shaft during the work. The spark lever should be fully retarded. Fig. 1 illustrates the position of the lever for both clockwise and anti-clockwise drive.

In replacing the high-tension wires—those leading from the distributor to the spark plugs—

shown at Fig. 2 and it will be noted that both leads from the battery are attached to the coil and not grounded. The wiring plan is simple and if the connections are made properly, no trouble should be experienced in rewiring the coil and magneto.

#### FORD WIRING DIAGRAM.

The Ford Times, a publication devoted to the interests of the Ford Motor Company, illustrates the wiring diagram of the ignition system of the model T car, which is reproduced herewith with changes to include the wiring of the timer, coil, etc. In the drawing the primary or low-tension wires are indicated by light lines, the high-tension or secondary by heavy lines, and the ground by dotted lines. The path of the currents is easily traced. In practise the roller of the timer rotates anti-clockwise.



Wiring Diagram of Model T Ford Ignition System, Showing the Path of the Primary and Secondary Circuits and Proper Location of Leads.

the firing order of the motor must be observed. With a four-cylinder engine it will be either 1, 3, 4, 2, or 1, 2, 4, 3, and in attaching the wires to the distributor terminals the firing order must be complied with.

#### Direction of Drive.

It is important that the direction of drive of the magneto be observed, and if the novice will remember that the distributor rotates in a direction opposite to that of the armature shaft, no trouble will be experienced. The direction of drive is noted by looking at the driving end, but it will be observed by the drawing at Fig. 3 that the circuit breaker and distributor are at the other end of the instrument. Therefore, if the magneto is driven clockwise, the distributor will rotate anti-clockwise.

The wiring plan of the model A Splitdorf is

terminal of the timer to a unit of the coil, as shown in the drawing. With the switch lever in position as indicated and with the roller between two contact blocks, the primary circuit is open. But upon contact being made between the roller and a block, the primary circuit is closed, and the vibrator is pulled down by the action of the current flowing in the primary winding of the coil. Upon the roller breaking contact, the vibrator moves upward. Continued contact of the roller and metal block results in a number of movements of the vibrator, giving forth the sound termed buzzing. The low-tension current is transformed or raised into a high by the secondary winding of the coil, and is led to the spark plug by a cable.

The proper interruption of the primary current and distribution of the secondary is obtained



by separate wires and coil units. As the Ford motor fires 1, 2, 4, 3, the primary wires are arranged in this order at the commutator, and the secondary leads in a similar manner. A little study of the wiring plan will show its simplicity. In the drawing the coil units are shown separate to illustrate the path of the primary and secondary circuits.

### TO ARRANGE FOREIGN TOURS.

#### B. F. Goodrich Company Offers Such Service to Motorists Going Abroad.

Americans planning motor tours through the chateaux district or along the Loire may appreciate the touring service rendered by the B. F. Goodrich Company, Akron, O., maker of Goodrich tires, which maintains depots throughout Europe. Many important details, such as obtaining passports, crating cars, securing licenses, following customs requirements, etc., are taken care of by this concern.

The Goodrich company also arranges, through its touring bureau, to secure membership in the Touring Club de France, the Association Generale Automobile in Paris and the Touring Club of Italy. Motorists who desire this service should get into communication with the factory in Akron, or any of the company's branches in large cities throughout the country.

### VANDERBILT AND GRAND PRIZE.

#### Manager Shettler Announces Details Concerning Santa Monica Events.

Leon T. Shettler of Los Angeles, Cal., who is looking after the details in connection with the holding of the Vanderbilt Cup and Grand Prize races at Santa Monica, Cal., next month, announces that the former event will be held Feb. 21, and the latter Feb. 23. Entries will close at the original fee, \$250 a car, Feb. 9, and at an advance to \$350, Feb. 16.

It is expected that the Vanderbilt Cup race will be for 294 miles, or 35 laps of the road course, heretofore used for the annual Santa Monica events. It will be a non-stock event, held under class E of the rules of the contest board of the American Automobile Association, and limited to cars of 600 cubic inches piston displacement. In addition to the possession of the Vanderbilt cup, the winner will receive a first prize of \$3000, and the other prizes will be as follows: Second, \$2000; third, \$1500; fourth, \$1000.

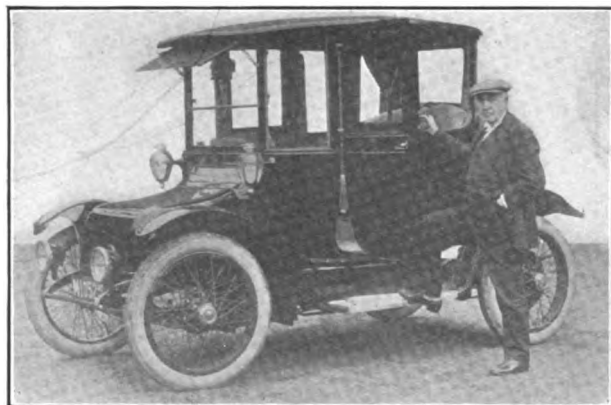
The Grand Prize race will be over the same course, but the distance will be approximately 400 or 450 miles. As in past years, it will be a free-for-all event, and the prizes will be similar in amount to those offered in the other contest.

It is announced that two Stutz cars and three Mercers may be counted upon as assured, and the list of drivers is expected to include Teddy Tetzlaff, Harry Grant, Ralph DePalma, Spencer E. Wishart, Ralph Mulford, Barney Oldfield, Gilbert Anderson and Earle Cooper.

### A PRINCELY GIFT.

#### Henry Ford Presents Thomas A. Edison with Handsome Detroit Electric.

Whether or not Thomas A. Edison and Henry Ford are collaborating on the production of a new electric car, which is to be sold at a price in



Thomas A. Edison and His New Detroit Electric, Presented by Henry Ford.

similar competition with other makes of electrics as that furnished by the Ford car in the gasoline field, it is of interest to note that Mr. Ford presented Mr. Edison with a handsome Detroit electric car on Christmas Eve. The accompanying illustration shows Mr. Edison about to enter the machine, which is fittingly described as a princely gift.

The machine is a model 47, made by the Anderson Electric Car Company, Detroit, and is mounted on the worm gear chassis. No expense was spared in preparing the interior with every luxury and modern improvement.

The Rex Ignition Manufacturing Company, New York City, maker of Rex spark plugs, has taken out a license under the so-called Canfield patent, held by the A. R. Mosler Company, Mount Vernon, N. Y.



## WARD ANNOUNCES ELECTRIC COUPE.

**C**ONSIDERABLE interest has attached to the latest product of the Ward Motor Vehicle Company, New York City, well known throughout the industry as a manufacturer of electric wagons and trucks. Some few months ago it was announced that this concern was soon to place in the market an electric pleasure vehicle, embodying some of the principles which have made its other line so satisfactory. This machine, a coupe, was shown for the first time during the recent New York show, and the complete car is presented in an illustration herewith.

The battery, consisting of 42 cells, of 11 plates, is located in front under the long, graceful hood, and the motor is so placed that attention is given through an opening in the floor, the object being to reduce the necessary work of

2.5 inches all around. Painting and upholstery are optional.

The interior fittings are held to be most complete, provision being made for a toilet case, complete with watch, memorandum book, perfume bottles, mirror, etc., and a silver mounted flower vase. The equipment also includes a speedometer, ampere-hour meter, head, side and tail lights, tool kit, oil can and jack.

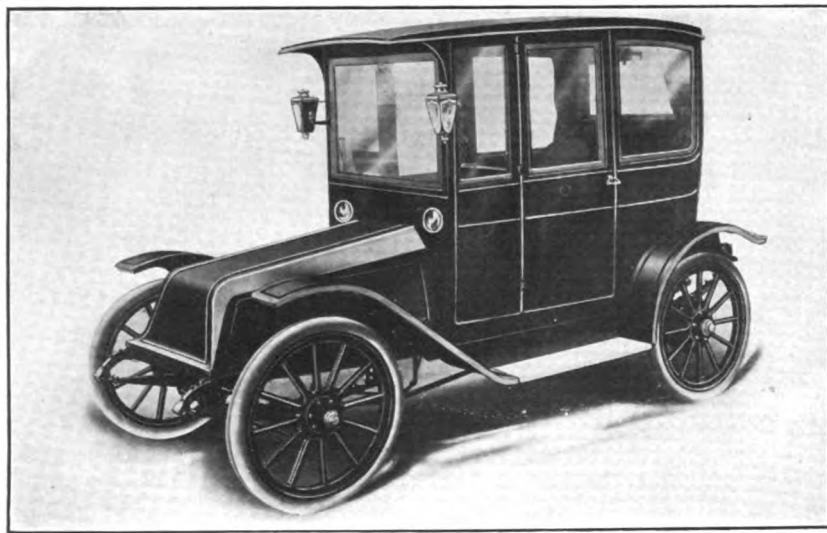
### CYCLECARS FOR POLICE.

#### New Jersey Authorities Considering the Purchase of the New Type of Machine.

The Imp Cyclecar Company, Auburn, Ind., through its agent in Maplewood, N. J., H. C. Fairchild, has received letters from the Newark police, the Essex county park commissioners and several township committees seeking information relative to the possibility of securing early delivery on Imp cyclecars. It is also stated that Chairman Robert G. Shaw of the Teaneck township committee has been corresponding with Mr. Fairchild regarding the practicability of equipping the police department of that town with such machines.

It is pointed out that the difference in price between motorcycles and cyclecars is one of the factors which has interested the Teaneck officials, who have received an appropriation of \$3500 to be used for one type or the other, at their discretion. The additional advantage of transporting a prisoner or an extra officer also is having its weight in the matter, and it looks very much as if the Teaneck police force would be the first in the country to use cyclecars.

Several creditors of the Brown Commercial Car Company, Peru, Ind., against which a creditor's petition was filed recently, are interested in seeing that the present receiver, William B. McClintock, is retained as trustee. There is said to be a strong probability that the concern will be reorganized, or, at least, continued as a going concern.



New Electric Coupe Produced by Ward Motor Vehicle Company.

labor and care to a minimum. Power is transmitted from the motor to the rear axle through a single set of well proportioned bevel gears. Two sets of brakes, light and power switches within easy reach of either hand, and a long steering handle, are expected to make the operation of the car a real pleasure. The mileage is rated at from 60 to 100 on one charge of the battery, and the speed is given as from 18 to 20 miles an hour.

Four persons are accommodated, the seats being so arranged that all passengers face forward. The wheelbase is 96 inches and the tread 56. The interior of the body is 72 inches, from the front to rear glass, and is 42 inches wide. The wheels are shod with Ward cushion tires, 32 by



## CORRESPONDENCE WITH THE READER.

**Thrust of Bearings.**

(1694)—Will you explain and illustrate how the end thrust is taken care of in the Timken type of roller bearings, and how the adjustments are made to eliminate lost motion? What is end thrust?

HUPMOBILE OWNER.

St. Albans, Vt., Jan. 12.

A simple example of end thrust is obtained when a car is turning a corner. Its momentum tends to keep the machine on its original course, and the passengers feel this force pushing them outward along the seat. This force, which is met by the bearings, is called end thrust, and comes in addition to the weight on the bearings. Another example of end thrust is the transmission of the power of the motor through the shaft to the driving pinion. The torsion of this pinion causes it to attempt to climb on the teeth of the

large gear with which it meshes. The bearings are two in number. The rear one prevents the climbing referred to and the other prevents the shaft moving backward. In this instance, movement in either direction is prevented. End thrust is compensated for in the front and rear wheels, also in the gearset shafts. Figs. 1 and 3 illustrate the points discussed.

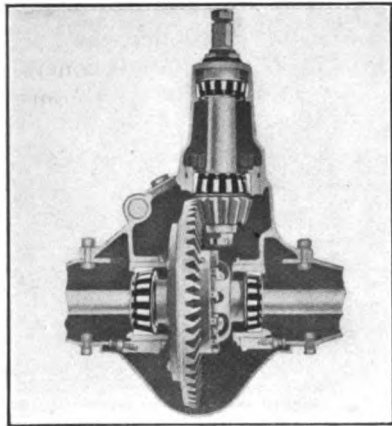


Fig. 1—How End Thrust Is Cared for in Opposite Directions.

By referring to Fig. 3, the Timken method of meeting end thrust will be noted. The arrows represent the direction in which end thrust bears upon the cup and cone, and the maker states that the tapered construction makes it impossible for the end force to push the cup and cone apart. A rib is utilized on the large edge of the cone to prevent the tapered rollers from being forced out from between the cone and the cup. The contact between the large ends of the rollers and this rib tends, in a very slight degree, to retard the large end of each roller. Another rib on the other end of the cone, against which a flange on the small end of the roller presses, prevents any tendency to twist the roller out of its alignment on the cone.

In a wheel bearing the load is borne by those rollers which are below the centre of the spindle. There is a slight play, almost imperceptible, in the parts of the bearing above the centre of the spindle. The purpose of the cage is to guide those rollers, which are above the centre in their proper positions, during their idle period, and correctly align them as they enter their working zone.

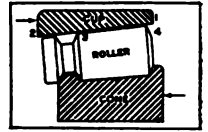


Fig. 2—Adjustment of Timken Roller Bearing.

If wear occurs, leaving a slight space between the cup and the roller, adjustment can be made by moving the cup or cone in the direction of the arrows shown in the drawing at Fig. 2. As 1-2 and 3-4 always remain exactly parallel, the adjustments bring the different surfaces into line contact without impairing the efficiency of the bearing. A discussion of bearings will be found elsewhere in this issue.

**Setting Model B Splittorf Magneto.**

(1695)—Having an opportunity to purchase a good second hand model B Splittorf magneto, and wishing to install it on my car, I would appreciate it if you would inform me how to change the magneto so that I can drive it left handed when looking at its driving end. It is now fixed to run in the opposite direction. The owner says that it can be done, but cannot explain, and a repairman advises me to let him do it. Would you advise trying it or let the repairman change it over? How is a four-cylinder magneto wired?

ADVICE.

Lynn, Mass., Jan. 14.

The magneto referred to can be driven in either direction, it being so constructed that it is a simple matter to make the change. The repairman's advice on magnetos should be heeded as a rule, but in this instance the change could be made by exercising caution in the work and by understanding the operation of the circuit breaking mechanism.

At Fig. 4 are presented two views of the circuit breaker mechanism, also a part sectional view of the distributor, which will be useful in setting the instrument. That at A depicts the setting when the magneto is driven in a right hand direction, looking at the driving end, while that at C shows the instrument operated in the opposite direction.

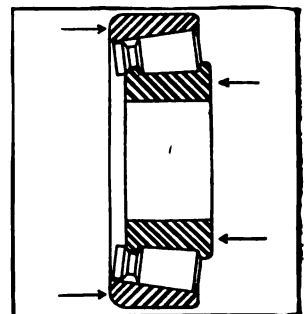


Fig. 3—Indicating End Thrust.

It will be seen that the break of the primary circuit, or the separation of the platinum contact



points, is accomplished by a pivotally mounted breaker bar which is actuated by a two-point cam. Upon a cam coming in contact with the breaker bar, the latter is raised. Normally the platinum points are contacted by the tension of a spring.

To change the direction of rotation of the magneto, remove the spring retaining the circuit breaker cover, and hold the driven end of the armature shaft firmly with a pair of pliers and displace the little nut. The cam referred to is retained by a Woodruff key. Remove the cam, turn it over and replace it on the shaft with a prick punch so that it will not jar off.

Next displace the distributor block by removing the screws retaining it, and take out the screws from the lettered ring. Remove the brass protecting cup on the distributor bearings, which

over the electrical types, but find them too expensive. I would like to know what other types there are in the market besides electric, either mechanical or any other forms. I noted in the Dec. 25 issue that certain persons are interested in forming a club or society to teach young men the automobile business. Kindly inform me where I can obtain information regarding the society.

WILLIAM HERZOG, JR.

Garfield, N. J., Jan. 12.

If the celluloid has become discolored throughout, its whiteness cannot be restored, but if superficially discolored, its condition may be considerably improved by wiping with a woollen rag moistened with absolute alcohol and ether mixed in equal proportions. This dissolves and removes a minute superficial layer and presents a new surface. To restore the polish, rub briskly, first with a woollen cloth and finish with silk or fine chamois. A little jeweller's rouge or Putz pomade will greatly facilitate work of renovation.

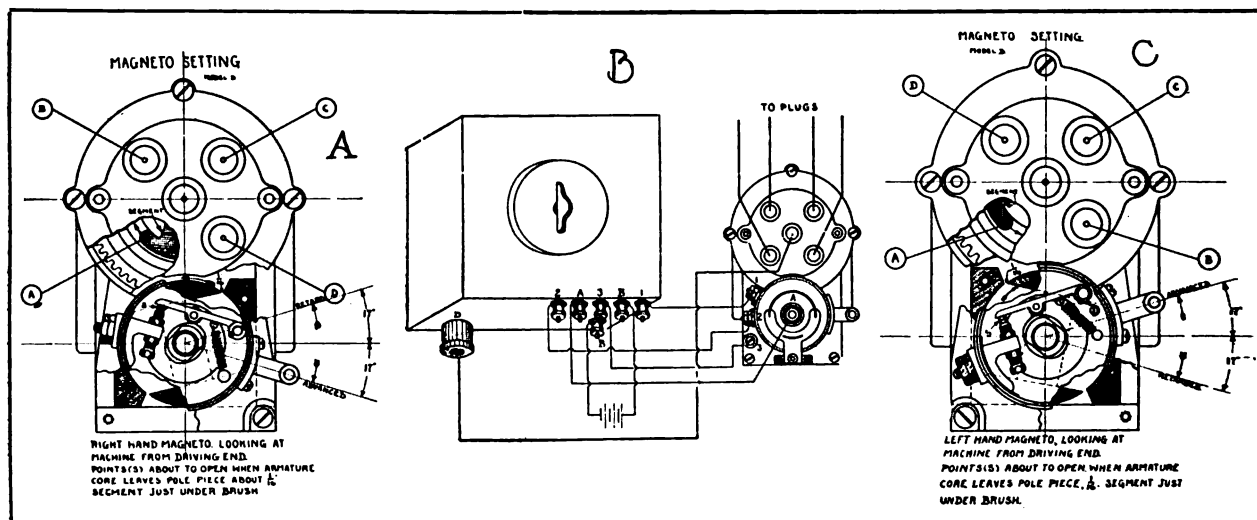


Fig. 4—Wiring Diagram of Model B Splitdorf Magneto and Proper Position of Armature for Setting for Both Right and Left Hand Drive, Viewing the Instrument from Its Driving End.

will be found inside the inverted U formed by the magnets, and displace the top screw located underneath the centre of the distributor shaft. The distributor and its gear can then be pulled forward out of mesh.

In replacing the distributor gear remesh the teeth of the driving and driven members so that the segment will agree with the drawing shown at C. With the contact points adjusted to have a break of .03125 inch, the points should begin to separate when the armature core leaves the pole, as shown in the illustration.

The Splitdorf Electrical Company maintains a branch at 182 Massachusetts avenue, Boston, where the change in the drive could be made at a nominal cost.

#### Wishes Motor Starter.

(1696)—How can I clean my celluloid windshield? I wish to install a motor starter on my car. I have looked

There are other forms of motor starters than the electrical, among which may be named compressed air, mechanical and acetylene. The first named comprises a power pump, which maintains the desired pressure in a tank, a distributor for timing the flow of air to the cylinders, control valves, etc.

Formerly there was listed a large number of makes of mechanical motor starters, but the very general adoption of electric systems has resulted in the majority of makers discontinuing the manufacture of mechanical types.

Another form is the acetylene starter. This comprises a valve for reducing the pressure of the Prest-O-Lite tank, a valve for mixing proper proportions of acetylene and air, and generally a distributor. The mixture is exploded in the cylinder by a spark. Some forms of acetylene starters provide for drawing in the mixture to the cyl-



inders by the suction of the piston, the mixture being led to the intake manifold by suitable piping.

The article appearing in the Dec. 25 issue of The Automobile Journal briefly outlined the plan formulated by the Metropolitan section of the Society of Automobile Engineers, New York City, to give a series of talks before the engineering societies of various colleges. The address of the Society of Automobile Engineers is 1790 Broadway, New York City. Complete information may be obtained from the secretary.

#### **Napier Specifications.**

(1697)—I have a four-cylinder Napier motor. Will you please inform me where it is built, and what the horsepower specifications are? F. W. A.  
Taunton, Mass., Jan. 10.

It is not possible to give the information desired as the model of car is not mentioned, or the bore and stroke given. While it would be a simple matter to ascertain the stroke by passing a wire through the opening of a petcock, and noting top and bottom dead centres, the measurement of the bore would involve the removal of a cylinder or the lower half of the crankcase.

The Napier machine is manufactured by D. Napier & Son, Ltd., with factory at Acton, London, England, and office at 14, New Burlington street, London, W. This concern should be able to supply complete details of the motor and car.

#### **Revolving Motor.**

(1698)—Will you please state in the columns of The Automobile Journal if there are any reasons why a revolving type of motor, such as employed with aeroplanes, cannot be used in an automobile? What is the proper dimension of a combustion chamber of a cylinder, the bore of which is three inches and the stroke five, four-cycle, and not having any side pockets or valve pockets in the head?

CONSTANT READER.

Mansfield, Mass., Jan. 11.

The revolving type of motor is not utilized in motor cars, because it is more complicated than the designs employed. One concern, however, made a car which was fitted with a five-cylinder revolving motor, but it is understood that the company has not manufactured the machine within the past year.

The area or capacity of a cylinder is generally between 20 to 25 per cent. and taking 23 per cent. as the average or mean, the dimension referred to would be approximately 1.15625 inch.

#### **Motor Back Fires.**

(1699)—What causes my motor to backfire when I start it on a cold morning? After it has run a few minutes the backfiring stops. SUBSCRIBER.  
Kenyon, R. I., Jan. 16.

The backfiring is due to the cold. At low temperatures the fuel does not vaporize as read-

ily as it does upon the motor becoming warm, and this results in too small a proportion of gasoline to the air, or a lean mixture. It can be remedied by adjusting the needle valve to supply more fuel, or decreasing the amount of air. Such an adjustment will, as a rule, provide a rich mixture when the motor is warm. If the adjustment of the carburetor is productive of satisfactory operation, it would be better to restrict the air openings until the motor becomes warm.

#### **EXCEEDS BURMAN'S RECORD.**

**Duray in 300 Horsepower Fiat Travels at Rate of 142.9 Miles an Hour.**

In the spring of 1911, Robert Burman drove the Blitzen Benz at a speed of 141.73 miles an hour on Ormond beach, Florida, thereby creating a world's speed record, which has remained until now. Recently, Arthur Duray, at the wheel of a 300 horsepower Fiat machine at Ostend, Belgium, drove a kilometer at the rate of 142.9 miles an hour. The mark cannot be accepted as a world's record, however, for the reason that European records are accepted only when the distance is covered in both directions, and then only the mean time is permitted to stand.

The attempt at the world's record was made on the shore road at Ostend, and conditions were considered ideal. In one direction Duray had a run of 2000 yards before striking the measured kilometer, and in the other 1600 yards. The best officially timed run in one direction was at the rate of 139.8 miles an hour. Another run in the same direction showed 142.9 miles, but the electric timing machine recorded only a streak.

Another attempt will be made by Duray with this machine in April, when it is expected that conditions will be even more favorable. At or about that time, it is anticipated that Chassagne will make a similar attempt on French roads with the 12-cylinder Sunbeam machine recently contracted for by Louis Coatalin of England.

Through the courtesy of the Automobile Club of America the use of the assembly room in the clubhouse, 247 West 54th street, New York City, has been made available for the January meeting of the Metropolitan section, Society of Automobile Engineers. This will be held Jan. 29 and the subject will be "The Gyroscope". E. P. Hopkins will read a paper explaining the application of gyroscopic influence to his mono-railway system, and Edward Durant will introduce a general discussion on gyroscopic action.





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**SHOWS A BUSINESS BAROMETER.**

If any further evidence were needed that the opportunity for making automobile sales was to be exceptionally bright during 1914, it is supplied by the record of attendance at the various shows now being held throughout the country. This was particularly true of the New York display, the attendance at which a year ago was exceptionally low. This year the number of paid admissions was larger each day than for any corresponding day during any previous show in that city.

The general public does not pay good money to visit an exhibition of goods of any character, which it is asked to purchase, without it is interested in the article on display. People must be interested in the purchase of automobiles, else it could not be expected that they would

visit the shows in such increasing numbers.

It is also of interest to note that business conditions generally have been looking much brighter since the opening of the New Year, and, in fact, since the middle of December. Financial papers state that merchants are beginning to stock up their shelves, and manufacturers to lay in a supply of material, anticipating a rush of orders in the near future. It looks very much as if the automobile shows were proving a decidedly dependable business barometer, and that conditions are improving rapidly.

**MOLINE-KNIGHT TEST.**

Automobile engineers and others, who have had certain misgivings concerning the practicability of the non-poppet valve type of motor in long continued service, will find much of interest in the results of the recent test of the Moline-Knight engine at the laboratory of the Automobile Club of America. Elaborate precautions were taken to have this test conducted by an absolutely impartial party, and the results thus obtained must receive general acceptance.

With respect to the questions involved, and entirely apart from the relative merits of this type of motor in comparison with any other type now in the market, the report indicates that the Moline-Knight engine fulfilled every claim made for it by the inventor and the manufacturer. While certain differences of opinion have been held, which permitted long discussion without satisfactory decision, this record breaking run has established definite facts beyond possibility of dispute, and the result must be very gratifying, not only to the Moline Automobile Company, but to other manufacturers using the Knight motor.

The announcement that one of the concerns in the automobile industry is to divide \$10,000,000 among its employees during 1914 has occasioned widespread discussion, pro and con, and it is somewhat amusing to note the difference of opinion which has resulted. Some suggest that the welfare of the industry may be involved. Others maintain that the plan adopted will have an injurious effect upon other concerns. Dealers and prospective purchasers contend that the surplus might have been so proportioned as to result in better profit to the former and a still further reduced first cost to the latter.



## WITH THE CYCLECAR MANUFACTURERS.

**Still Trying to Secure a Suitable Definition---Two Long Distance Trips Demonstrate Practibility Under Adverse Road Conditions---New Models Announced.**

**W**HEN is a cyclecar not a cyclecar? During the progress of the New York show, which was the first time the new type of machine has played an important part in direct competition with the so-called small car, several manufacturers sought to adopt a rigid rule by which it would prove possible to determine the line of demarcation. The result does not appear to have been in any way decisive, and it is doubtful if any general agreement can be reached at present.

The definition, "A cyclecar is an automobile built on the simplest possible lines", is held by some manufacturers to be altogether too general. For the most part, those who object to this wording are engaged in the production of a small car, which they maintain is as simple as a practical automobile can be built, yet they feel their product should not be classified as a cyclecar.

These men suggest the following: A cyclecar is (1) a motor vehicle with tread of less width than standard, (2) a motor vehicle weighing less than 1000 pounds, (3) a four-wheeled motor vehicle that does not follow the generally accepted automobile design with respect to the use of parts of standard type and construction, and with respect to the seating arrangement.

Concerning these proposed definitions: The first would rule out the Chautauqua, Cornelian and Downing, each of these machines, which in all other respects appear to meet the generally accepted idea of a cyclecar, having tread of 56 inches. The second would exclude the two two-passenger Car-Nation models, one of which weighs 1050 pounds and the other 1150. By common consent, the Car-Nation touring car, seating four passengers, has not been included in the cyclecar class from the beginning, but other cyclecar manufacturers are said to be considering the production of a touring model, seating four, which they desire to have termed a cyclecar.

The third definition appears to be the result of an attempt to avoid calling the cyclecar an automobile, and really complicates matters still further. Under its terms, a four-wheel motor vehicle seating two persons side by side and utilizing a four-cylinder motor, selective type transmission and floating rear axle with differential, would become an automobile, but the same car seating its two passengers tandem would be a cyclecar.

It is very obvious that the time will come when something definite will have to be decided upon, and perhaps, when that time comes, it will be found desirable to include the differences mentioned in all three suggestions, classifying a machine as a cyclecar in the event it fails in any one particular to reach the standard set for automobiles.

### THREE SEATS WITH LINCOLN.

**American Motorette Company of Detroit Changes Name of Concern and Car.**

Some of the foreign cyclecars have seating accommodations for three persons. One of these was shown at the Importers' Automobile Salon



**The New Lincoln Highway Roadster Model.**

in New York City the first of the month. The Lincoln highway roadster, formerly the American motorette, made by the Lincoln Motor Car Company, Detroit, formerly the American Motorette Company, provides for three persons, but there is a vast difference between the design of this machine and the three-seaters from abroad. In fact, there is bound to be some question as to whether this machine should be listed as a cyclecar.

It weighs 950 pounds. Its wheelbase is 100 inches. The maker has not seen fit to make public the tread measurement. Ordinarily, it seats two persons, side by side, but is provided with an auxiliary seat, which may be folded and removed from the car, or folded against the side, as desired. The driver is placed at the left.



with central position of the control levers.

The motor is a four-cylinder, four-cycle, water-cooled unit, cast en bloc, with bore of 2.81 inches and stroke of four inches, rated by the maker at 20 horsepower. The upper half of the crankcase is cast integral with the cylinders and carries all of the working parts of the motor. The lower half is one piece of strong stamped steel construction, and forms an oil well. This motor is placed under a hood of the so-called foreign type, with the radiator in the dash. Ignition is by Splitdorf high-tension magneto, and all wiring is carried in the channel of the frame, being protected from grease, etc. The carburetor is a Mayer. Lubrication is by a combination force feed and splash system.

The clutch is of the cone type, housed with the flywheel. The transmission is of the progressive type, affording two forward speeds and re-

toric in a measure. By no means the least interesting of these was the 1000-mile trip from Detroit to New York City, made by W. H. Smith of Auburn, Ind., in an Imp, produced by the Imp Cyclecar Company of Auburn.

Smith left Detroit Dec. 30 and arrived in front of the Grand Central Palace on Jan. 8, despite heavy snow storms and badly drifted roads encountered. Aside from the breaking of one pulley carrying the belt drive, necessitating driving some 38 miles with one belt, and the freezing of the lubricating pipes, because of the intense cold, the Imp suffered no mechanical troubles.

As originally planned, the Imp was to have been one of a half dozen cyclecars to leave Detroit, Dec. 28. After waiting two whole days for the other contestants to arrive, the plans were changed, and Smith finally left Detroit accompanied by W. B. Stout of Chicago to serve as the official observer.

The 60 miles between Detroit and Toledo were covered in six hours. The roads were in very bad condition, due to a heavy thaw which preceded a fall of snow. Several drifts were encountered between Toledo and Cleveland, and the belt pulley cracked a short distance beyond Elyria. The remaining 38 miles was made on one belt, through eight inches of snow.

The party waited at Cleveland a day and a half for baggage to arrive, and the drive from that city to Erie was made in blizzard weather, intense cold, deep snow and steep hills forming a combination

which made forward progress decidedly difficult at times. Stout retired as observer at this point, and Smith continued, after some delay in Erie, utilizing railroad and trolley tracks, where the drifts proved too deep in the road. His arrival in New York was one of the surprises of show week.

Concerning that portion of the trip in which he was a participant, Stout is quoted as follows:

This trip has proved a number of things. It has proved that 36-inch tread is applicable to American roads. It has proved the reliability of friction and belt drive, and that the belts will run in wet, in snow, in mud, and, if long, on small pulleys. It has shown an advantage of many gear ratios with an air-cooled motor, and has proved that the cyclecar is a real vehicle capable of great reliability. It has shown also the great advantage of tandem seating for touring work and comfort, for we carried a top and windshield and all directly against the driving blizzard in six to 11 inches of snow, and often on high gear at that. By letting the heat from the motor back into the car we were warm at all times.



The Imp Cyclecar Which Made the Trip from Detroit to New York in Nine Days.

verse, with direct drive on the high. Final drive is by shaft to a semi-floating rear axle. The service brake is located on the propeller shaft back of the transmission, and the emergency brakes are internal expanding on the rear wheels. Springs are semi-elliptic in front and full elliptic in the rear. Wire wheels are regular equipment, although an option of wood members is permitted. The tires are 30 by three inches.

### DETROIT-NEW YORK TRIP.

#### Imp Covers Practically 1000 Miles in Nine Days Despite Heavy Snow.

The New York automobile show was made the occasion of a number of cross country cyclecar runs, each of which may be regarded as his-



**GADABOUT HAS NOVEL LINES.****Car with Wicker Basket Body Built in Detroit  
by New York Concern.**

A short time ago announcement was made of the incorporation of the Gadabout Motor Corporation in New York City, with the following officers: President, Robin A. Lau; first vice president and general sales manager, Charles Vail; second vice president and New York sales manager, J. Dean Grandin; third vice president, A. Vernon Clarke; secretary, Edward M. Simpson; treasurer and general manager, Philip Heseltine; consulting engineer, Walter A. Gruenberg. At that time there was little to indicate that this concern was to engage in the production of a cyclecar. Such, however, appears to be the plan, and it is stated that the car will be produced in Detroit. The main office of the company is at 29 Broadway, New York City.

It is stated that the new machine will have a number of distinguishing characteristics, chief among which is the wicker basket body, seating two persons side by side. The wheelbase is 86 inches; tread, 46, and road clearance, nine.

The motor is a four-cylinder, four-cycle, water-cooled unit, cast en bloc, with bore of 2.5 inches and stroke of 3.5, being rated by maker at 12 horsepower. Lubrication is by a sight feed splash system. Carburetion is by a Schebler. Ignition is by magneto. Drive is by shaft, with a transmission gearset affording two speeds forward and reverse. The driver is located at the left. Wheels are of wood, fitted with 28 by three-inch tires.

**FALCON'S LONG JOURNEY.****Makes the Trip Over the Mountains from  
Cleveland to Staunton, Va.**

The Falcon cyclecar, which left Cleveland, O., Dec. 29, arrived at the new factory of the Falcon Cyclecar Company in Staunton, Va., Jan. 9, after a most strenuous trip over the mountains of Pennsylvania. The machine drove up in front of the Hotel Virginia at 7 in the evening, and it and the driver were the centre of interest for a large crowd until 4 the next morning.

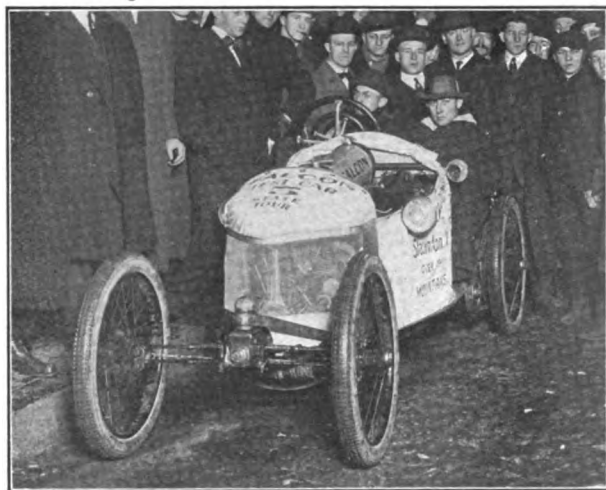
When the machine left Cleveland it was in charge of Bryce E. Blackley, assistant production manager for the company, accompanied by George F. Cox. They bore letters from Mayor Newton D. Baker of Cleveland and from the Cleveland Automobile Club to Mayor Hampton

Wayt and the city council of Staunton.

Soon after the start the party experienced one of the worst snow storms which has swept the southern Ohio and Pittsburg district in the past few years. The machine was snow bound near Columbiana, O., for three days, after which the trip was resumed to Pittsburg, through deep snow practically all of the way.

Blackley became ill at Pittsburg, but continued at the wheel until the party reached Meyersdale, Penn., where he finally collapsed. He was relieved by F. R. Hoyt, designer of the Falcon, who drove into Hagerstown, Md., after an all night run from Cumberland. The following day the party went down the Valley national pike to Staunton.

Within 25 miles of the destination, on a perfect road, after the snow bound ways had been passed, the only serious mishap of the trip oc-



**Bryce E. Blackley Leaving Cleveland, O., for Staunton, Va., in Falcon Cyclecar.**

curred to the machine. While travelling at high speed the little car hit a sunken railroad crossing just outside of Harrisonburg, Va., breaking a front spindle, reported to have been due to a blowhole in the metal. The car went into the ditch, but did not upset and neither occupant was injured.

President M. W. Mercereau of the Falcon Cyclecar Company has the following to say regarding the trip:

This is the first severe test which the cyclecar has received since its introduction in this country, and the success of this trip indicates that, in spite of the views of foreign makers, an American cyclecar will endure the worst of road conditions in the country. Nothing, since the famous tour of the Mud Larks, has equalled this trip for adverse conditions, and the little Falcon has come through where few, if any, big cars could drive. We believe that this demonstration will greatly benefit the cyclecar movement as a whole, and show more clearly than ever the tremendous field which exists for this type of vehicle.

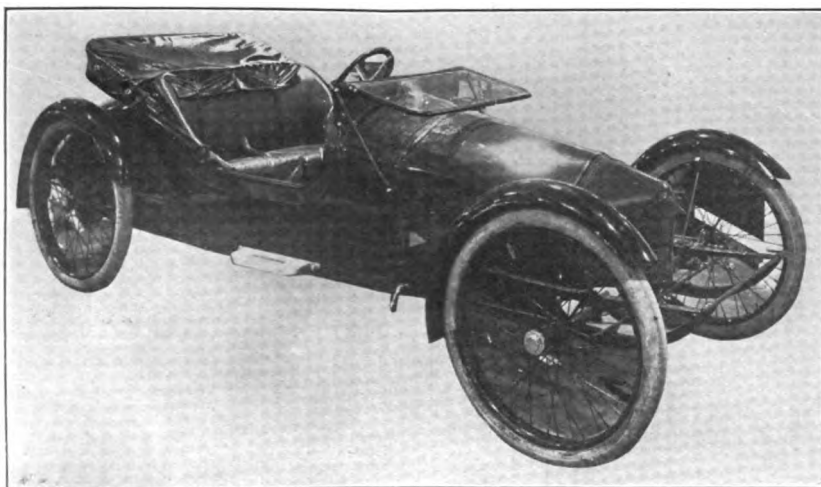


### FOUR LAVIGNE MODELS.

#### Detroit Manufacturer First to Announce an Enclosed Body Design.

One of the selling arguments employed by dealers in seeking to interest the motorcycle enthusiast in the cyclecar is based upon the equipment of the latter with a top, affording shelter from the elements. In this respect, at least, the cyclecar offers the same protection as the average automobile. And there certainly seems no good reason why this feature should not be carried one step further, with the presentation of the enclosed body type.

So far as is known, however, the LaVigne Cyclecar Company, Detroit, is the first manufacturer in this country to announce a body of this type. The LaVigne cyclecar is the design



Three-Quarters View of the New LaVigne Cyclecar, Which Is Produced in Four Body Designs.

of J. P. LaVigne, and to this chassis are to be fitted four body styles, a two-passenger roadster, cabriolet and coupe, and a parcel delivery wagon. Each of the pleasure vehicles is arranged to seat the passengers side by side. The roadster design was the only one displayed at the recent New York show. The wheelbase of the chassis is 96 inches and the tread 50. The weight ranges from 650 pounds for the roadster to 800 pounds for the delivery wagon.

The motor is a four-cylinder, air-cooled unit, the cylinders being cast en bloc, with bore of 2.375 inches and stroke of four. The horsepower rating is given by maker as 15. The motor is located under a pointed hood, and the fan which assists in cooling is at the right of the motor. Lubrication is by constant level splash, with pump circulation from an oil tank of three quarts ca-

capacity. The five-gallon gasoline tank in the dash feeds by gravity to the Schebler carburetor, and ignition is by either Bosch or Mea magneto, at the option of the purchaser.

Power is transmitted by shaft direct from the motor to the worm gear on the rear axle, through a multiple disc clutch, Raybestos lined, and a transmission gearset affording two forward speeds and one in reverse. The service brake is of the expanding type on the rear wheels, and the emergency brake contracts on the universal joint. The rear axle is of the semi-floating type, with worm drive and differential. Springs are semi-elliptic, 32 inches in front and 36 in the rear. The wheel bearings are fitted with balls in the front and Hyatt roller in the rear. Wire wheels are fitted, these being shod with Goodyear 30 by three-inch tires.

The frame is of pressed steel channel section, and is a pronounced underslung type, with road clearance of 10 inches. The equipment for the roadster includes the top and windshield, and provision may be made for fitting the Kemco fan type electric lighting system. The car is said to have demonstrated its flexibility in speeds varying from three to 50 miles an hour on experimental trips over rough roads in Michigan, and a fuel consumption of from 40 to 50 miles to the gallon.

Production work already has been begun on the two upper floors of the factory occupied by the LaVigne Manufacturing Company. The offices of the

LaVigne Cyclecar Company are at 521 Lincoln avenue, Detroit.

### ANNOUNCES CHAUTAUQUA MODEL.

#### H. J. Newman to Produce Cyclecars of Conventional Design at Jamestown, N. Y.

H. J. Newman, who has been connected with the automobile industry for a number of years, is interested in the formation of the Chautauqua Cyclecar Company, with headquarters and factory at Jamestown, N. Y. The Chautauqua model is stated to be conventional in design, with seats arranged side by side. The wheelbase is 102 inches and tread 56. Thus it becomes one of the few machines made in this country with a standard automobile tread.



The motor is a 12 horsepower, twin-cylinder, air-cooled unit, utilizing a Schebler carburetor and magneto ignition. The car employs a friction transmission, with final drive by V belt. Three speeds forward and reverse are permitted. Two brakes of the contracting type operate on the jackshaft, and emergency brakes of the expanding type are fitted to the rear wheels. The wire wheels carry 28 by 2.75-inch tires. The weight is 600 pounds.

### FLAGLER FROM CHICAGO.

#### Another Friction Driven Model with Factory Located on Michigan Avenue.

The Flagler Cyclecar Company, 1334 Michigan avenue, Chicago, is announcing a friction driven model with seats arranged side by side, for which exceptionally light weight is claimed. The chassis has a wheelbase of 90 inches and tread of 42, and the first complete car is said to have tipped the scales at 450 pounds. Tests of this machine on the road are stated to have resulted in a speed of 40 miles an hour and a fuel consumption of 54 miles to the gallon.

The motor is a two-cylinder, four-cycle unit, rated by the maker at 10-12 horsepower, with piston displacement of 69.7 inches. Lubrication is automatic with valveless pump on the motor, and a two-gallon supply is carried in a tank under the hood. The fuel tank, also under the hood, carries five gallons. Drive from the friction transmission is by 1.25-inch V belt. The change speed lever at the right side gives three speeds forward and reverse. The equipment includes two electric side and a tail lamp, current being supplied from a storage battery.

### GENERAL CYCLECAR NEWS.

#### Other New Models Announced in Brief—New York Club Organized.

The Robie cyclecar is announced from Chicago, fitted with a two-cylinder, air-cooled motor of 3.5-inch bore and 4.09-inch stroke, friction transmission under the hood, drive by single side chain to live rear axle, without differential. The wheelbase is 108 inches, tread 36. The two passengers are seated tandem. A distinctive feature is found in the use of sheet metal disc wheels.

The American Cyclecar Company, Seattle, Wash., has been incorporated by Daniel Murray, George L. Grant and others, and has purchased a factory site on 12th avenue, between Union and

Pike streets. The announcement further states that the car will utilize a three-cylinder, two-cycle motor, developing about 12 horsepower; friction transmission and chain drive to the front axle. It will weigh about 650 pounds and will seat two passengers side by side. The wheelbase is to be 96 inches and the tread 40.

The Gramm Motor Truck Company, Walkerville, Ont., across the river from Detroit, is said to have produced the first Canadian cyclecar. It is equipped with a twin-cylinder, air-cooled motor, and seats its passengers tandem.

Three cyclecars, a Dayton, a Puritan and a Frederickson, participated in the first American cyclecar run, under the auspices of the Chicago Cyclecar Club, New Year's Day, going over the Chicago-Elgin route. Although the speed limit was set at 17 miles an hour, it is stated that some of the machines made better than 20.

The Cyclecar Club of New York has been organized in that city, with the following temporary officers: President, Joseph A. Anglada; secretary-treasurer, R. F. Kelsey. It is planned to hold meetings monthly on the second Tuesday.

### FIVE ENTRIES NOW.

#### Beaver Bullet Makes Fifth in List of Competitors for Speedway Honors.

Five entries have been enrolled for the fourth annual international sweepstakes, or 500-mile race, on the Indianapolis motor speedway, Memorial Day. The fifth was filed by the Beaver Automobile Company, Beaver Falls, Penn., which enters the Beaver Bullet, driver not named. The concern is a new one, and it is stated that it is seeking an opportunity to "make good in a day", as was true of the Stutz entrant in the first 500-mile race in 1911.

The other entrants are two Stutz machines, an Anel and a Gray Fox. Unofficial announcement has been made that Robert Burman will be at the wheel of the Anel. Additional entries are expected from the Maxwell and Mercer factories in this country, Sunbeam and Vauxhall in England, and Peugeot and Delage in France. Harry Grant is said to have purchased two Sunbeams for this event, one of which probably will be driven by himself and the other by Chasagne, the world's hour record holder. Goux and Boillot are expected to be at the wheels of two Peugeots, and Guyot, who drove a Sunbeam in last year's race, undoubtedly will drive a Delage. It is possible that one or two Mercedes machines will be added to the list shortly.



## WITH THE MOTORING INTERESTS ABROAD.

### British Motorists Much Concerned Respecting Sale of Gasoline in Bulk---Constructional Details of Marshall Arter Cyclecar--News Notes from Foreign Lands.

**B**RITISH motorists are very much disturbed just at present because certain dealers in petrol or motor spirit—that is, gasoline—have adopted the plan of selling this fuel in bulk. Heretofore, it has been the practise in England, when the car owner demanded 10 gallons of gasoline, for instance, to unseal five two-gallon tins and pour the contents in the fuel tank of the machine. Also, the owner might purchase as many of these two-gallon tins as he desired and store them on his own premises.

The new plan is not thoroughly established as yet. One portion of the British motoring public objects to the innovation on the ground that it no longer will be possible for the purchaser to feel reasonably assured that he is receiving the

termed in England, which is soon to be introduced in this country, James M. Carples of 1784 Broadway, New York City, having secured the manufacturing rights for the United States. One of these machines is said to have covered 10,000 miles over English roads at a cost of .59 pence a mile, or a little more than one cent in American money. This figure included gasoline at 39 cents a gallon and the government tax of \$16 a year.

As produced in England, this machine seats two persons side by side. The wheelbase is 105 inches, tread 43 inches and extreme width 52. The motor is a four-cylinder, water-cooled unit, cast en bloc, with bore of 60 mm and stroke of 110 (2.36 by 4.33 inches). The maker's rating is 12-14 horsepower. Lubrication is by pump, cooling by thermo-syphon, carburetion by a Zenith and ignition by a Bosch high-tension magneto.

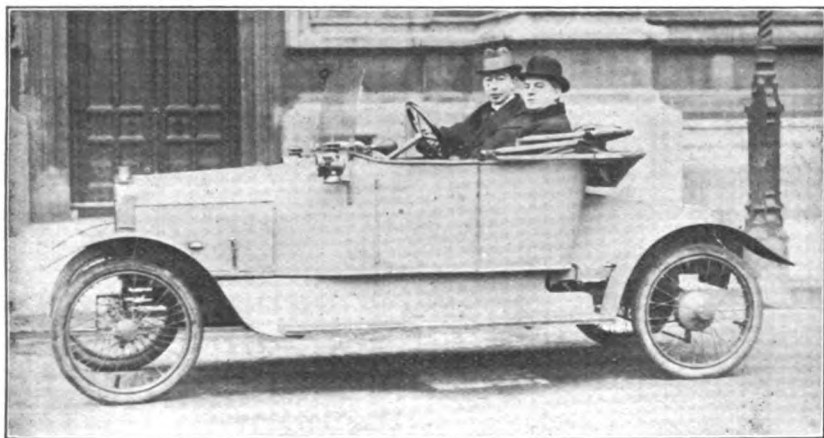
The clutch is a leather faced cone and the transmission of the power is by enclosed shaft to selective transmission, which with the differential is embodied in the rear axle. The reverse gear is brought into action by means of a separate lever, but it is held to be impossible to engage this when either the two forward speeds are in use, automatic stops being provided. Quarter-elliptic springs are utilized, front and rear.

The body design is somewhat typical of the British cyclecar, and is termed a standard torpedo model with side door. The driver is located at the right. The equipment includes a top, windshield, side and tail lamps, horn and set of tools.

#### WAGE EARNER OR DOMESTIC.

#### Chauffeur Question Now Before Industrial Court in New South Wales.

Some time since it was pointed out in these columns that the question as to whether a chauffeur was a domestic servant or a wage earner was causing some little trouble for employers of



Marshall Arter and James M. Carples in Marshall Arter Cyclecar Before House of Lords in London, England.

grade of fuel for which he is paying. Others hold that substitution is possible, even with the sealed tins, since the purchaser rarely inspects the seals, relying solely upon the honesty of the dealer. Those who take the latter view believe that, by constructing a private storage tank, the motorist can save money by purchasing fuel in quantity.

#### MARSHALL ARTER LIGHT CAR.

#### Constructional Details of British Cyclecar Soon to Be Produced Here.

An accompanying illustration presents the Marshall Arter cyclecar, or light car, as it is



Great Britain. The scene has now shifted to New South Wales, where the chauffeurs recently formed a union and are seeking to be placed under the jurisdiction of the wages board, which has the power, under the arbitration act, to fix minimum wages, conditions of employment, etc.

The matter was brought to the attention of the industrial court, before which the Automobile Club of Australia appeared to contend that a chauffeur was a domestic servant, and as such did not come under the provisions of the act. The club maintained that a domestic servant, such as a coachman who learned to drive his master's car, did not by that act cease to be a domestic servant. The union, on the other hand, urged that the mechanical skill required to drive a car placed the chauffeur in the class of a skilled craftsman. The court left matters very much as they were, by referring the question to the wages board, which already had the power to determine whether or not chauffeurs came under its jurisdiction.

Incidentally, it may be stated that the chauffeur's union asks for a wage of £3 15s (\$18.25) a week, and if more than one car is kept 10 shillings a week extra. If an employer provides board and residence, the driver is to pay for these at cost price, with the option of boarding elsewhere if he so desires. A day's work is to be nine hours, work between 7 in the morning and 5 in the afternoon, or 8 in the morning and 6 in the evening, with an hour off for lunch. Overtime must be paid for at time and a half, with double pay between midnight and 4.

Both the Motor Traders' Association of New South Wales and the Automobile Club of Australia have representation on the wages board, and it is expected that the fight will be continued in that body. It is interesting to note in this connection that the wages boards of Victoria and Queensland have granted the men employed in private service £2 10s (\$12.25) a week.

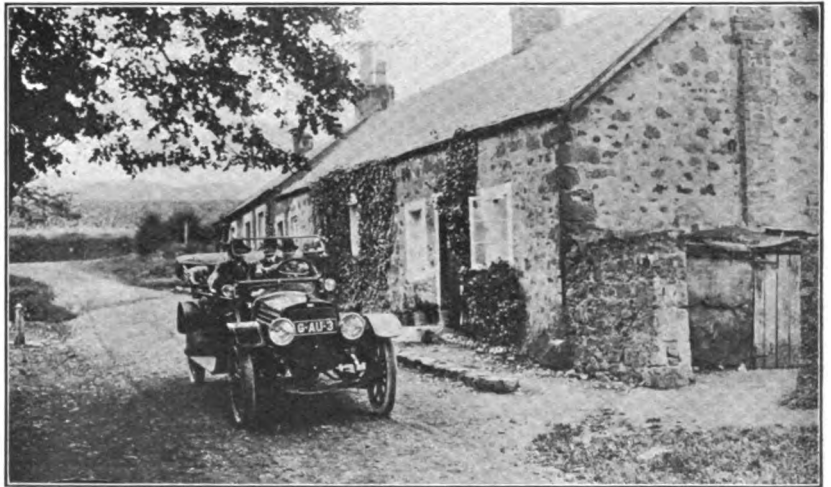
### TRIAL FOR CYCLECARS.

#### Scottish Automobile Club Is Considering Plans for Competition in June.

The secretary of the Scottish Automobile Club is issuing a circular letter to manufacturers

of cyclecars, or light cars as they are now more generally termed in Great Britain, calling attention to the plans of the club for a reliability trial during the third or fourth week in June. The letter states that the trials and competitions committee has been asked by several prospective purchasers to conduct an event of this character, and before proceeding further with the details, it is the desire of the club to learn whether or not makers will enter machines in sufficient number to make the contest a success.

It is proposed that the distance shall be between 700 and 750 miles over Scottish roads, and that the event shall include a number of hill climbing tests. The entries are to be confined to machines of not less than 800 nor more than 2000 cc in engine volume (40-122 cubic inches), and weighing not more than 800 pounds, complete with body. The contest is to be divided



Party of Tourists in Louser Car at Robert Burns' Birthplace in Scotland.

into classes, in which price will be the controlling factor.

### GENERAL NEWS FROM ABROAD.

The annual Swedish winter reliability trials for the Gothenburg and Winter trophies will be held between Stockholm and Gothenburg and return, Feb. 8-11. A hill climbing test and fuel consumption trial will be included in the event.

It is reported from Stuttgart, Germany, that a Grand Prix race will be organized in that country for next September. It is proposed to limit the event to cars with maximum cylinder capacity of 4000 cc (244 cubic inches). The distance will be about 430 miles.

The death of Leon Bollee is reported from France. Mr. Bollee was one of the pioneer manufacturers in the industry, and as early as 1896 he took one of his tandem motor tricycles across the channel to England, where it created a decided sensation. The machine was fitted with a single-cylinder horizontal motor, three-speed sliding gearset, and final belt drive to the single wheel in the rear. Later, after making a decided mark for himself in the automobile field, he took up aviation and was well known as the manufacturer of aeroplanes and aerial engines.

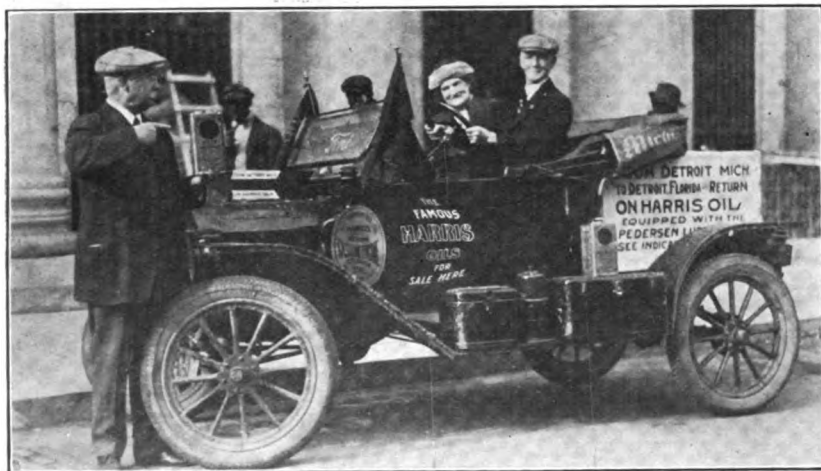


## REGARDING TIRE SIZES.

## Goodyear Company Reports the Result of Recent Detailed Investigation.

The standardization of everything pertaining to an automobile is proceeding steadily. Recently, the Society of Automobile Engineers took up the matter of tire sizes, and an effort is being made to reduce the total to about 12. In this connection, it is of interest to note that the Goodyear Tire & Rubber Company, Akron, O., has completed a detailed investigation of this subject and reports the result as follows:

In cross section there is a steadily greater demand for larger tires. There is a reason for this. Of tires returned to the manufacturers it was found for instance, that five times as many 34 by four-inch tires were damaged in the fabric as the 35 by 4.5-inch size. Six times as many 32 by 2.5-inch tires had fabric breaks as 32



Mr. and Mrs. W. J. Brewster, Detroit, Mich., En Route to Detroit, Fla.

by four, and the same comparison applies to 36 by four and 37 by 4.5, and to 34 by 3.5 and 35 by four.

In other words, where larger alternative tires are used, fabric damage is largely eliminated. What little does occur in the larger sizes results directly from under inflation or accident. Tire companies are naturally advocating the use of larger tires wherever possible, as a protection not only to themselves, but to car owners as well. The result is already seen in lower mileage costs.

## ANNUAL EXIDE DINNER.

## Will Be One of the Features of the Week in Which Chicago Show Is Held.

For the past six years one of the social features of the Chicago automobile show week has been the annual Exide dinner, given by the Electric Storage Battery Company of Philadelphia to the electric vehicle manufacturers, their agents and the Exide battery distributors throughout the country. This dinner will be held

this year Wednesday, Jan. 28, at the rooms of the Mid Day Club.

Invitations will be eagerly sought after. The dinner was a brilliant success last year, and it is hoped that this year's menu and entertainment will equal if not surpass the record set at that time.

## FROM DETROIT TO DETROIT.

## Long Distance Trip Demonstrates Value of Harris Oil and Ford Car Combination.

W. J. Brewster of Detroit, Mich., evidently believes in combining business with pleasure, and he also has great faith in Harris oils, made by the A. W. Harris Oil Company, Providence, R. I. He recently completed an automobile trip from Detroit, Mich., to Detroit, Fla., the latter being a small town just below Miami, and probably not known to the average reader.

Mr. Brewster was accompanied by his wife, in a Ford car, as shown in an accompanying illustration, which also indicates, in a measure, the important part which Harris oils played on the journey. It is not just clear, from the illustration, whether the trip was for pleasure or profit, but, judging from the inscription on the forward door, it would appear that Harris oils were dispensed en route.

Mr. Brewster reports that he went through with practically no trouble at all, and he attributes the absolute lack of engine or transmission trouble to the use of this brand of oils. He found the roads for the most part in excellent condition and that the journey, while long, proved interesting at every stage.

The second annual meeting of the Chamber of Commerce of the United States will be held in Washington, D. C., Feb. 11-13. This organization now comprises 488 chambers of commerce, boards of trade and similar bodies throughout the country. The annual banquet will be held on the anniversary of Lincoln's birth, and during the session of the first day Secretary Wilson of the Department of Labor will address the members on the subject, "The Relation of the Department of Labor to Industry and Commerce".



## IN THE COMMERCIAL VEHICLE FIELD.

### Constructional Details of Model B Two-Ton Wichita Truck—Features of Tilling-Stevens Gasoline-Electric Chassis—Machines in Varying Service.

**A**BOUT two years ago, the Wichita Falls Motor Company, Wichita Falls, Tex., was organized to produce the Wichita truck, and the first models displayed at the automobile shows in the Southwest were of such character as to meet instant approval. Since that time the sales of Wichita trucks in the Southwest have increased very rapidly, and the company is now extending its agencies into the South and Middle West. An accompanying illustration presents the model B, which differs from model A only in the frame and other proportions, the power plant being the same.

The motor is a four-cylinder, water-cooled unit of the L head type, with cylinders cast en bloc. The bore is 3.25 inches and the stroke five, giving a horsepower rating of 16.7 under the S. A. E. formula, although the maker states that it will develop 25. The crankcase is of the barrel type with large bolted-on plates carrying the end main bearings, and with a base that forms the oil reservoir. By removal of the base and end plates, and after loosening the connecting rod big ends, the crankshaft may be withdrawn without difficulty. The timing gears are forward of the front end plate and are housed in a separate case, which has independent means of lubrication.

Cooling is by the thermo-syphon system, and lubrication is by combined force feed and splash, the oil circulating through a glass indicating gauge on the dash. Ignition is by either Bosch or Eisemann magneto at the option of the purchaser. The carburetor is of the automatic float feed type.

The clutch is a leather faced cone of ample proportions, and the transmission is of the selective sliding gear type, affording three forward speeds and reverse. Final drive is by jackshaft

and side chains. The frame is of pressed steel channel section, and is carried on semi-elliptic springs, the rear suspension being with outside brackets. The front axle is an I section, and the rear a rectangular section, both drop forged from high grade steel. The service brake is expanding, operating on the jackshaft, and the emergency members are also expanding in rear wheel drums. The wheels are 34 inches in diameter, and are shod with 3.5-inch shoes in front and three-inch dual in the rear, both fitted with demountable rims.

The driver is placed at the right, with centre control. The wheelbase is 118 inches and the tread 56. The chassis has rated capacity of two tons, and is supplied with varying body equip-



Model B Two-Ton Wichita Truck, Made by Wichita Falls Motor Company.

ment to meet the requirements of the purchaser. The company also is prepared to furnish bodies suited for fire department service.

As a result of a novel competition, in which 20 representatives of as many leading makes of commercial motor vehicles submitted their product for examination and test, H. Paulman & Co., agent for Pierce-Arrow trucks, recently was the successful bidder for four machines to be supplied to the city of Chicago. The machines first underwent a 54-mile run, a portion of which was over muddy ground, and then were submitted to technical examination conducted by the bureau of engineering.

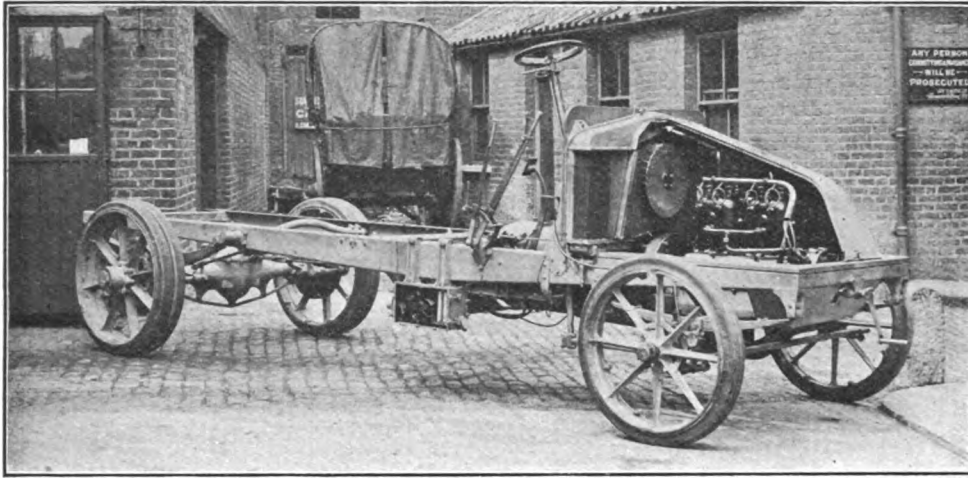


## TILLING-STEVENS OMNIBUS CHASSIS.

CONSIDERABLE interest attaches to the Tilling-Stevens gasoline-electric chassis utilized by Thomas Tilling, Ltd., in omnibus

carburetor is a Solex, made in Great Britain.

The electrical portion of the equipment consists of a generator, a series wound electric motor and the controller box, the last named carrying a reversing switch and a shunt resistance for the generator fields. The dynamo is connected direct to the gasoline engine by means of a flat leaf spring, no friction clutch being used. The generator, which is capable of an output varying from one to 20 kilowatts at speeds varying from 350 to 1400 revolutions a



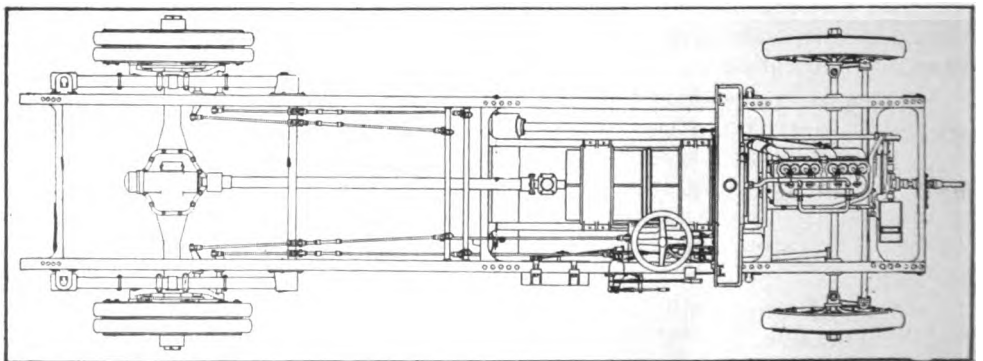
**Tilling-Stevens Omnibus Chassis with Hood Removed, Showing Gasoline Motor.**

minute at a voltage varying from 0 to 300, has been designed so that any increase in the demand for current when the engine is fully loaded is accompanied by a corresponding reduction in voltage.

The output in kilowatts at any speed is proportional to the power exerted by the engine, but the volts and amperes may vary over a large range according to the gradient, speed or degree of acceleration required. The amperes required by the series wound motor are nearly proportional to the voltages of supply. It follows that when the vehicle is running on the level road the demand for amperes will be small, but on gradients it will considerably increase, with a corresponding decrease in voltage, resulting in a slower speed with increased torque, and this

service in London, England. Accompanying illustrations present the chassis details, and make possible study of the design. The particular feature, to which special attention is drawn, is the elimination of the usual clutch and gearbox and the substitution therefor of a flexible electrical transmission between the gasoline engine and the driving wheels, which is held to give, among other results, remarkably easy starting and control, and silent running.

It may be stated that the gasoline engine has four cylinders, with bore of 105 mm and stroke of 125 mm (4.13 by 4.82 inches), giving a rating of 27.25 horsepower under the R. A. C. formula, which is the same as the S. A. E. in this country. The cylinders are cast in pairs. Cooling is by water, and further assisted by a disc fan carried on the rear of the dynamo shaft, the motor and dynamo being of the semi-enclosed type. This shaft, as well as the motor shaft, is mounted on ball bearings. Lubrication of the motor is by a splash system. Ignition is by Bosch high-tension magneto, and the



**Plan View of Tilling-Stevens Chassis, Indicating Location of Electric Dynamo.**



change is said to take place automatically.

On level roads and ordinary gradients the whole of the control is effected by the gas throttle pedal. On steep gradients the shunt resistance must be employed to permit increased engine speed. The control has three positions—forward, neutral and reverse—the whole of the speed regulation being effected with the one po-

sition of the controller. As the generator ceases to excite at 300 revolutions a minute of the engine, it is not necessary to break the circuit between the dynamo and motor, upon stopping in traffic, for instance, as by the release of the throttle pedal and the consequent slowing down of the engine no power is transmitted to the driving shaft. In other respects, design is standard.

### PARCEL POST SERVICE.

#### Special Body Equipment on Commercial Wagon Utilized in Jacksonville, Fla.

The demand of the parcel post service, which was inaugurated by the Postoffice Department a year ago in January, was expected to make itself felt in the use of commercial motor vehicles, and, while the government has purchased but comparatively few machines, many are in use in various sections of the country. With the increase in weight of the parcels which may now be shipped by parcel post, it is anticipated that even more attention will be given to this subject.

Several manufacturers have considered the desirability of special body equipment, the controlling factors being those of securing the advantage of all available space and providing protection against the weather. In connection with the first it must be remembered that all classes of merchandise may be sent through the mails, and that it is necessary to prevent the possibility of crushing or damaging the contents of the packages.

An accompanying illustration presents an example of body construction on a Commerce light delivery wagon, made by the Commerce Motor Car Company, Detroit, and utilized in the collection and distribution of parcel post packages in Jacksonville, Fla. This is an express flareboard type, with stanchions supporting a standing roof that is carried forward above the seat to the dash, vertical stay rods strengthening it. Side, rear

and front curtains afford protection in the event of storm. The construction is light and enduring, and well adapted for the handling of the load from the sides or end.

### AN AMERICAN CHAR-A-BANC.

#### GMC Chassis Fitted with Sightseeing Body in Service in California.

Within the past year decided interest has been awakened in Great Britain and European coun-

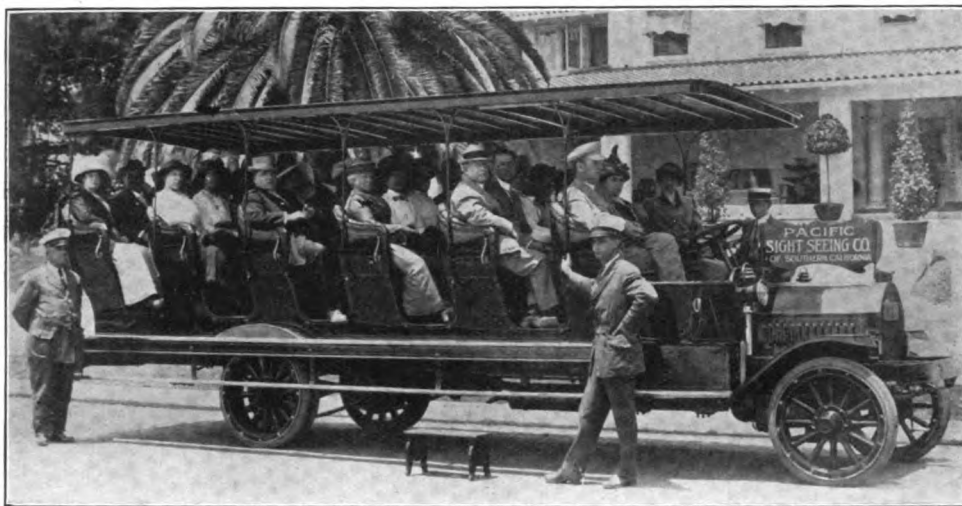


Commerce Delivery Wagon with Special Parcel Post Body in Florida Service.

tries in the availability of the so-called char-a-banc in developing tourist business for hotels and others. In America there also has been a tendency toward the utilization of motor truck chassis for similar purposes.

An interesting example is that supplied by the Pacific Sightseeing Company of Pasadena, which employs a GMC two-ton truck chassis, made by the General Motor Truck Company, Pontiac, Mich., and equipped with a special body installation, as indicated by the accompanying illustration. The city is located in the centre of a very beautiful section, and this machine is oper-





**GMC Chassis Equipped as Sightseeing Wagon in Service in Pasadena, Cal.**

ated on a schedule, which permits opportunity to enjoy two trips a day, one of 40 miles and the other of 12.

The body is of such width that wheel housings are provided for the rear wheels. Six transverse seats provide capacity for 30 persons, and above these, supported by steel stanchions, is the roof. Provision also is made for completely enclosing the body during storm by means of side curtains, fitted with celluloid windows.

#### **OPERATING IN A BLIZZARD.**

##### **Practicability of Pierce-Arrow Worm Driven Truck Tested in Severe Service.**

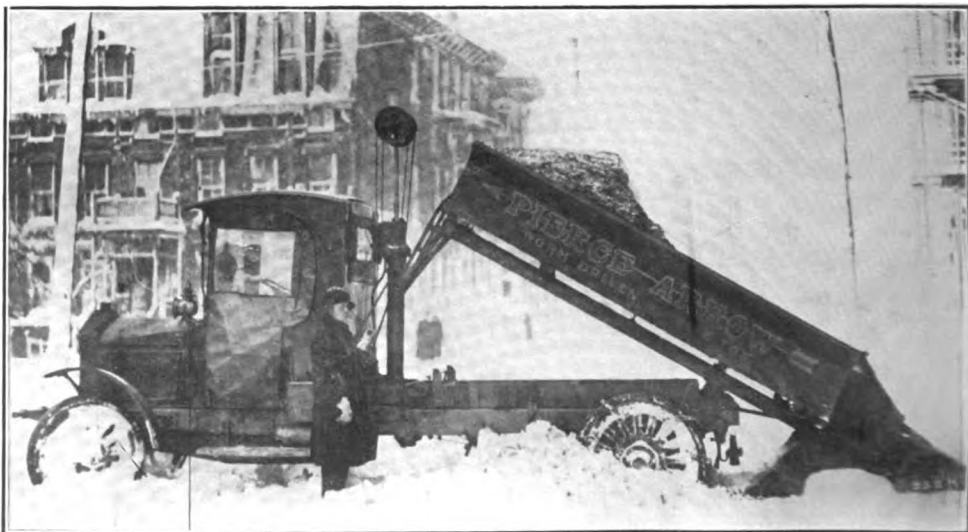
There is some little contrast between the balmy, summer setting of the upper picture on this page and that of the Pierce-Arrow five-ton, worm driven truck working in blizzard weather in the lower, but the two photographs demonstrate the wide range of possibilities in motor truck haulage. The lower picture was taken during the very severe snow storm which blockaded the streets of Cleveland, O., for several days recently. The average depth of the snow was 22 inches, and in places

this was drifted to five and six feet.

The Zittlemeyer Coal Company tried to use four and six-horse teams in the delivery of fuel, which was urgently needed in many sections of the city. At last it called upon the Cleveland agent for Pierce-Arrow trucks, made by the Pierce-Arrow Motor Car Company, Buffalo, N. Y., who placed the machine shown at its disposal.

The truck was loaded to capacity and was kept at work from Monday until Wednesday afternoon, with a stop from 3 to 5 Tuesday morning and another from 3 to 7 Wednesday morning. It was a standard five-ton model, fitted with an hydraulic hoist and dumping body. The motor was running continuously during the time the machine was in service, and the difficulty of securing traction may be judged from the fact that more than 60 feet of tire chains were used during the three days, the links breaking and necessitating renewal at frequent intervals.

Chin Gow, a Chinese vegetable gardener in Portland, Ore., recently purchased a 1500-pound truck, with which he is able to rush vegetables to market in rapid time in comparison with the methods employed by his competing countrymen.

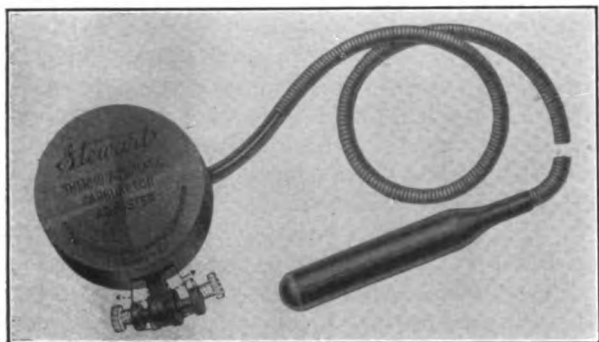


**Five-Ton Pierce-Arrow Worm Driven Truck Working During Blizzard in Cleveland.**



# STEWART AUTOMATIC CARBURETER ADJUSTER.

**I**T IS estimated by an authority on carburetion that the majority of owners operate their cars on too rich a mixture to make for efficiency



**Fig. 1—Stewart Thermo-Adjuster, Which Automatically Regulates the Air or Fuel by a Novel Use of Mercury.**

and economy. This is particularly true in cold weather when the fuel vaporizes less readily than in the summer, and when starting is more difficult. While it is true that the carburetor manufacturer has made progress in overcoming troubles experienced with the present grade of fuel, his suggestions for economical operation are frequently disregarded in an endeavor to obtain easy starting. In other words, the fuel supply is increased to eliminate starting troubles.

A rich mixture has its disadvantages. It is wasteful of fuel, creates sooty deposits, and the motor does not develop its maximum output because of the improper proportions of fuel and air. While it appears to the novice that the motor operates smoothly after being started from cold with a rich mixture, he does not take into consideration the fact that upon the cylinders attaining an operating temperature of, say, from 170 to 180 degrees, the flow of fuel or its emergence from the jet is considerably faster than at starting. One authority holds that there is a difference of 39 per cent. from the same sized opening in a change of 15 degrees.

While it is possible to adjust the carburetor with a rich mixture for starting, and to change it back to the original setting, it requires a knowledge of the carburetor, as well as frequent alteration, and a large number of owners prefer the easy starting mixture to a lean, economical one. The last named in low temperatures is productive of back firing when a cold motor is started. Changes in temperature have their effect upon carburetion, and to offset these variations dash or steering post control has been adopted

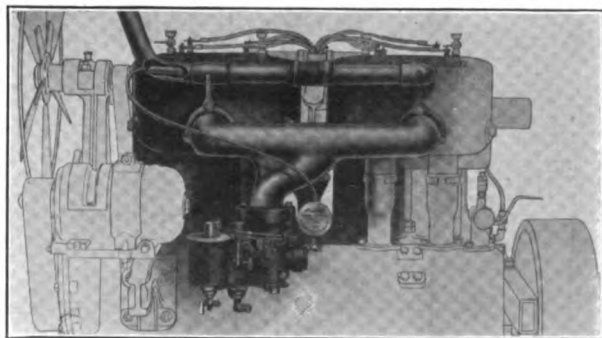
by the majority of carburetor manufacturers.

The Stewart-Warner Speedometer Corporation, Chicago, exhibited at the New York show a thermo-automatic carburetor adjuster, which is designed to automatically regulate the operation of the carburetor by temperature. It is the invention of a racing driver who made an exhaustive study of carburetion, and any change in temperature is compensated for by a novel, yet simple, use of the sensitiveness of mercury.

The Stewart thermo-automatic carburetor adjuster is composed of a metal bulb, connection tubing and a Bardon coil enclosed in a metal box, from which protrudes a plunger or pushrod as shown at Fig. 1. The bulb is tapped into the water circulation system, in the outlet water manifold, for example, as shown at Fig. 2, and the adjuster proper is attached to the carburetor in such manner as to permit the pushrod or plunger to actuate the air valve or needle valve of the carburetor. The movements of this rod are indicated by the dotted lines at Fig. 1.

The temperature of the fluid in which the bulb is immersed causes the mercury to contract or expand, as the case may be, and the pushrod is actuated accordingly. It is claimed by the inventor that the thermostat will operate within one degree of the indicated temperature, and that the maximum valve movement is .3125 inch.

With the Stewart, the carburetor is adjusted as nearly correct as possible, but the adjustment of the device is so made as to have no effect except when the temperature of the water jacket falls below 180 degrees Fahrenheit. At this point, and to 40 degrees, it is held that the Stew-



**Fig. 2—Showing the Stewart Device Installed on a Rayfield Carburetor—The Bulb Is Located in the Outlet Water Manifold.**

art will automatically regulate the mixture.

The qualities claimed for the invention are: It increases the density of the mixture for starting



when the cylinders are cold, automatically proportions the fuel in accordance with the temperature of the combustion, preventing waste of fuel, and obtains maximum efficiency from the motor by reason of a perfect mixture throughout the entire range of adjustment on any carburetor.

The chart at Fig. 3 brings out the points emphasized in the Stewart device. AB represents the entire range of adjustment on any carburetor; A being the point where back firing occurs. C indicates the 180-degree point, held to be the most efficient and economical. D is the 90-degree point, where it is claimed that the majority of carburetors are adjusted so as to obtain easy starting. E is the 40-degree point, where it is stated the Stewart device provides the richest mixture possible.

The intersecting line C denotes the ideal adjustment, where the most economical and most efficient proportions of fuel and air are obtained when the motor is operating under perfect conditions and the temperature of the water is 180 degrees. With the lowering of the temperature the conditions represented by A will be experi-

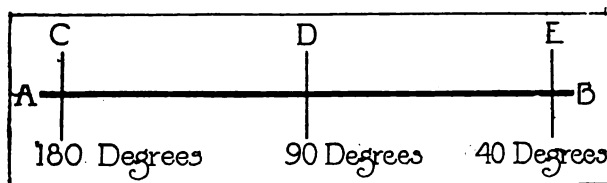


Fig. 3—Chart Showing Various Carburetor Adjustments.

enced. With the adjustment as indicated by D the easy starting is offset by too rich a mixture, upon the cylinders attaining their working temperature. E indicates the 40-degree point, where it is pointed out that the Stewart device provides a rich mixture; that is, under conditions requiring more fuel or less air, as in starting in low temperatures.

With the Rayfield carburetor, as shown at Fig. 2, the Stewart operates on the air valve, a loose sliding collar being employed. At low temperatures the pushrod increases the tension of the spring controlling the air valve, decreasing the supply of air and enriching the mixture to meet conditions. Under ideal operating conditions the Stewart is inactive. Changes in temperature, however, are automatically compensated for as previously explained.

The Stewart thermo-automatic adjuster is designed for service with all types of carburetors and eliminates changing the proportions of fuel and air. It is the intention of the company to manufacture the Stewart adjuster for application to the exterior of the circulating system, elimin-

ating the tapping of the water pipes or manifolds.

### ILLINOIS GARAGE ASSOCIATION.

#### Members Will Hold Their Annual Convention During Progress of Chicago Show.

The Illinois Garage Association, composed of representatives from local associations throughout the state, will hold its first annual convention at the Lexington hotel, Chicago, during the progress of the annual national automobile show in that city, Jan. 27-28. It is probable that a permanent organization will be brought about at that time.

The object of the association is stated to be: To establish a friendly relation between the members and promote their general welfare by elevating the standard of efficiency for garage employees, by standardizing and improving the service to be rendered by garages and by co-operating in the enactment, or repeal, of laws and ordinances relative to garages and the operation of automobiles, also to encourage touring.

It is expected that some 400 delegates will be present, and these will be entertained at the show the evening of Jan. 27, and the following evening by the Chicago Garage Owners' Association. The organization committee is composed of the following:

John W. Morsbach, Chicago, chairman; E. J. McGuirk, Chicago, temporary secretary; William L. Rudd and Frank H. T. Potter, Chicago; Robert Bland, Evanston; W. C. Bode, Oak Park; Charles L. Turner and Fred Poshard, Peoria; M. Fry, Champaign; Basil W. Ogg, Springfield; A. C. Berthold, Aurora; Faust H. Boyd, Ashton; W. E. Keck and G. H. Steineck, La Grange.

President George A. Kissel of the Kissel Motor Car Company, Hartford, Wis., states that never before has a national automobile show witnessed so many actual sales as were recorded during the progress of the New York show just closed, while the record breaking attendance indicated unmistakably a lively spring market. No less pleasing to him are the results in Philadelphia, Los Angeles and Milwaukee, where the dealers' shows, held the week following the New York display, set new marks for those cities.

The following officers have been elected by the Bay State Automobile Association, Boston, Mass.: President, W. H. Stevens; vice president, J. J. McNamara; secretary and treasurer, E. K. Sweet; directors, E. A. Gilmore, Chase Langmaid, Joseph Donovan, R. R. Ross and Dr. H. D. Boyd.



## IMPROVED ROADS AND MOTORING LAWS.

### Michigan Court Asked to Declare New Statute Unconstitutional—Ohio's Governor Calls Special Session to Amend Warnes Law—Good Roads News.

**A**TTORNEYS representing citizens of Detroit appeared before the supreme court of Michigan, Jan. 7, to argue against the constitutionality of the so-called Bricker-Smith law, passed at the last session of the legislature. The action was brought into court under mandamus proceedings to compel the secretary of state to accept a straight \$3 license fee, as provided under the old law, in lieu of 50 cents a horsepower, demanded under the provisions of the new law.

The Detroit attorneys maintained that the new law was absurd, because the steam and electric vehicles were accepted at the manufacturer's rating, which was held to be without uniformity or reliability. It also was contended that some automobiles selling at \$300 have horsepower equal to others selling at \$3000. The law was further held to be discriminating in character, in that manufacturers and dealers were permitted to pay a tax of \$50 for the first five machines operated by them and \$10 for each additional car, regardless of horsepower.

Attorney-General Fellows, representing the state, contended that the commonwealth had a right to exact a toll from users of the highways. He asserted that no discrimination had been shown by arbitrary classification, as uniformity could not prevail. He declared that the automobile license law was purely a police regulation.

#### TO AMEND WARNES LAW.

#### Governor of Ohio Calls Special Session of the Legislature for This Purpose.

Governor Cox of Ohio has called a special session of the state legislature for the purpose of amending the so-called Warnes law, which was declared unconstitutional by the courts of that commonwealth recently. He thinks he has found a way to impose the increased registration fees and so word the law that it will meet with the approval of the courts.

The original law provided that the entire surplus, over and above the cost of administering the law, should go into the general fund. Governor Cox asks the legislators to consider an amendment providing that this surplus shall be diverted to the good roads funds. While there

was a time when automobile owners were inclined to accept such provisions, the motorists of Ohio object strenuously to paying the excessive fees created by this law and are much opposed to the amendment.

#### SAND-CLAY ROADS.

#### United States Government Offers Advice as to Construction and Maintenance.

There are at present about 35,000 miles of sand-clay roads in the United States, mainly in the southern states, according to the office of public roads, Department of Agriculture, which authority states that the time to work such roads is in the spring. It is further pointed out that the type is cheap, comparatively firm and durable, and easy to construct and repair. The office of public roads offers the following suggestions:

The sand-clay road is made by mixing the sand and clay in such manner that the grains of sand touch each other, the spaces between the grains being filled with clay, which acts as a binder. The approximate mixture of sand and clay may be determined by filling a vessel with a sample of the sand to be used, and another vessel of the same size with water. The water is poured carefully into the sand until it reaches the point of overflowing. The volume of water removed from the second vessel represents approximately the proportion of clay needed.

If the road to be treated is sandy, the surface is first levelled off and crowned with a road machine, the crown being about .5 inch to the foot from the centre to the sides. The clay is then dumped on the surface and carefully spread, so that it will be from six to eight inches in depth in the centre, and gradually decreasing in depth toward the sides. A layer of clean sand is then added, which is thoroughly mixed with the clay, either by traffic or by means of plows and disc or tooth harrows.

If the road to be treated is composed of clay, it should first be brought to a rough grade with a road machine. The surface should then be plowed and thoroughly pulverized by harrowing to a depth of about four inches, after which it is given a crown or slope of about .5 inch to the foot from the centre to the sides. It is then covered with six to eight inches of clean, sharp sand, which is spread thicker in the centre than at the sides. The materials should then be mixed with plows and harrows while they are comparatively dry, after which they are finally puddled with a harrow during wet weather. If clay works to the surface and the road becomes sticky, more sand should be added.

After the clay on sand, or sand on clay, road is completed it should be carefully maintained until the surface becomes firm and smooth. The construction of this type of road is by no means a quick operation. If soft, sticky places appear, more sand should be added, and if loose, sandy places are found, more clay is needed. It is just as important to attend to these small details as to any other part of the work, for, if they are neglected, the road is liable to fail.

It requires approximately one cubic yard of clay to surface 1.5 running yards of road 12 feet in width, or about 1175 cubic yards to the mile. From .75 to one



cubic yard will make a load for two horses on a dry clay road. The cost of the road will therefore depend largely upon the distance the material is hauled, the average being from \$500 to \$1000 a mile. A road built under the direction of the office of public roads at Gainesville, Fla., one mile long, 14 feet wide, and having nine inches of sand-clay surface, cost \$881 a mile, or 10 cents a square yard. Another sand-clay road built by this office at Tallahassee, Fla., 16 feet wide and seven inches thick, cost \$470 a mile, or about five cents a square yard.

### ATLANTA SECURES CONVENTION.

#### American Highway Association Will Meet in That City Next October.

As a result of the contests among 10 of the leading cities in the United States for the honor of entertaining the 1914 American road congress, under which title the American Highway Association and the American Automobile Association hold their annual road conventions, Atlanta, Ga., is announced as the winner. The decision was made by the directors of the American Highway Association at a meeting held in New York City this month. The convention will be held Oct 19-26.

At this meeting, also, Fairfax Harrison, who succeeded the late W. W. Finley as president of the Southern Railway Company, was elected a vice president to succeed Mr. Finley, and it is understood that he will be selected as chairman of the executive committee. In accepting the position, Mr. Harrison stated that he intended to carry on the work of improved highways in the South.

### CONVICT LABOR ON ROADS.

#### Much Interest Being Developed as Result of Pending Legislation.

The National Committee on Prison Labor, which is very much interested in convict road work, believes that the development of such plans in every state of the Union will be the natural outcome of the passage of the Boeher-Hughes bill, now pending in Congress. This bill seeks to limit interstate commerce in convict made goods, by subjecting such goods to the laws of the state into which they come. Inasmuch as this is expected to destroy the present contract system, other means will necessarily have to be found to keep the prisoners busy, and the committee feels that this will be road work.

The movement was given additional impetus last month, when the constitutional amendment was adopted in Kentucky, permitting the use of prisoners on public highways in that state. Plans for drafting the necessary legislation are well

under way, the chairman of the legislative council of the Kentucky Federation of Labor being particularly active in this direction.

Twenty-five governors have placed themselves on record as favoring the working of convicts in the construction and repair of highways, and have laid the matter before the legislatures in their respective states.

### A PRACTICAL DEMONSTRATION.

#### Maintenance Experiment Covering 700 Miles of Highway in the South.

The American Highway Association has arranged, in co-operation with the federal office of public roads, with the road officials in Virginia, North Carolina, South Carolina and Georgia to conduct an ambitious maintenance experiment on the road from Washington, D. C., to Atlanta, Ga. Over 700 miles of highway are expected to be improved and kept in condition as a result of this test.

The association will enlist the support of the counties and districts traversed by the road, and, wherever possible, induce local authorities to place the highway under the supervision of government engineers who will be detailed from the office of public roads for that purpose. The object of the scheme is to prevent the improved portions from deteriorating for lack of suitable care, and to make the unimproved portions as comfortable for travel as possible with the money available. In addition, of course, it is expected to result in a continuous maintenance object lesson that will be a stimulus to other sections of the country.

The American Highway Association has undertaken to raise the money for the travelling expenses of the engineers who will supervise the work. Leonard Tufts is chairman of the committee having the plan in charge.

### LINCOLN HIGHWAY BRIEFS.

De Kalb, Ill., claims the honor of being the first city in the United States on the route of the Lincoln highway to officially change the name of its principal thoroughfare, Main street, to Lincoln highway. This action was taken at a special meeting of the city council.

Citizens of Massillon, O., have placed the official marker of the association on the boulevard lights which line the route through that city.

At a meeting in Upper Sandusky, O., attended by 400 business men and farmers, a committee was appointed to interview every resident and obtain contributions.

The Glidden Highway Association of Glidden, Ia., has posted eight miles of the Lincoln highway through that town with the official emblem of the association.

Clarkson Dye, representing the Chinese Chamber of Commerce and Chinese Native Sons of the Golden Gate, San Francisco, Cal., has written E. P. Bringer, California state consul for the association, offering the generous support of the Chinese in the work in that state.



# ANALYZES ROLLER BEARINGS.

Professor Goodman of Leeds University, England, Discusses Various Types and Gives Results Obtained in a Series of Experiments and Practical Tests.

PROFESSOR Goodman of the Leeds University recently gave a lecture before the Institution of Automobile Engineers, London, Eng-

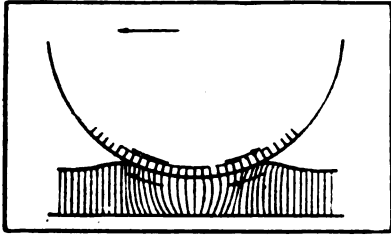


Fig. 1—Showing Frictional Resistance of Elastic Roller on Elastic Bed.

land, on ball and roller bearings, a report of which is given here-with. He was a railway engineer before he became a university professor, and for many years, in addition to the work incident to a professor of engineering, devoted himself to a persistent series of experiments with roller and ball bearings. He is recognized as an authority upon the subject throughout the world.

In opening, he said that, although it had been known 4000 or 5000 years that the resistance of a body sliding on a flat plane was from 30 to 50 times as great as that of a body on a rolling plane, it was only within the last few years that rollers had been successfully applied to bearings. The reason why they had not been successfully applied was one of the points he hoped to bring out in the course of his lecture. He proposed to deal simply with general principles, and could not profess to touch on the application of bearings to automobile work. There were many others who knew far more about that aspect of the subject than he did, and he hoped they would be induced to deal with it. Prof. Goodman then proceeded to deal with the subject of his lecture, illustrating his remarks by means of lantern slides.

## Frictional Resistance.

The first diagram, Fig. 1, by Prof. O. Reynold, illustrated frictional resistance of an elastic roller on an elastic bed, showing how this was entirely different from friction of a cart wheel over a muddy road. Prof. Reynold showed that if circumference of a roller were marked off in equal parts, and the bed were also marked off in equal parts, prior to application of roller, when the roller was placed on the bed and commenced to roll in one direction, portions of the bed spread on both sides of the roller and formed a hollow in the middle and a hill formed at either side in front and behind the roller. There was no slipping at all between the roller and the bed. The slipping occurred in one direction in the bed, while the movement of the roller was in the other direction. The friction between the roller and its bed, due to its expansion, was against the direction of rolling, so that the friction at one point hindered the roller from working over the path. Similarly, as the roller left any point the bed contracted, and, again, the friction on that portion tended to hinder the rolling of the roller on the path. That was the base of the action of a roller on an elastic path. Suppose a lubricant, such as oil or graphite, was interposed, the friction would be diminished at two points, but, owing to the fact that the width was increased over which slipping occurred, the friction would be increased at other points. The two actions almost counteracted one another, with the result that in general there was practically no difference in the rolling resistance of a roller when the surfaces were lubricated and when they were perfectly dry. With a perfect roller or

ball bearing exactly the same action was present. The resistance of the bearing, and therefore the friction produced was independent of the lubricant.

## Slip of Rollers.

There was also another very important point. Owing to the stretch of the bed upon which it worked, the roller moved less than its geometrical distance, because the length of the path became stretched, and if one very accurately measured the distance that the roller moved and compared it with the circumference of the roller, one would find that it was always short of its true distance. That was when one had a hard roller on a soft bed. A very beautiful experiment was shown by Dr. Hele-Shaw in one of the Cantor lectures which he delivered some five or six years ago, showing exactly how the slip occurred, the nature of the slip, and the nature of the surfaces. Prof. Reynold was unable to detect any difference in length between the circumference of a cast iron roller and the path it traversed. The amount of slip which occurred was very small. In a roller or ball bearing it was very easily measured and it played a very important part. There was always slip whenever an elastic roller rolled on an elastic bed. His (Prof. Goodman's) own tests showed that the amount of slip depended very largely on the load. There was a very small amount of slip with a light load and light pressure, and a very large—extremely large—amount of slip when the pressure became large.

## Early Types of Bearings.

He threw on the screen a slide of an ordinary type of roller bearing which he had chosen as one of the best of the old type, to show in this particular case the effect of a hardened steel sleeve and a hardened steel liner. These rollers were beautifully fitted in, ground, finished and hardened, and they were kept in position in a gun metal cage. This gave some idea of the ordinary type of roller bearing. In another example he showed a lighter type of roller cage. There was always end thrust on the rollers, they bore hard on the ends of the cage and pushed it up against the flange of the casing, thus causing a very serious amount of friction to occur. There were also other troubles, which were not at all easy to overcome. The next slide, Fig. 2, showed one of the very earliest roller bearings known—the earliest he had been able to find. It was shown at the Institution of Civil Engineers, and a description of it appeared in the proceedings of that body. It was intended to be used for the axle of a railway train. The inventor pointed out that from the first he had the greatest possible trouble with it, due to end thrust on the rollers. He investigated the matter carefully and found out exactly the cause of the end thrust, and he then endeavored to get over it by the very amateurish method of putting India rubber bands on the rollers. He was very sanguine of success at first, but if one looked at the proceedings of the civil engineers some three or four volumes further on one would find another short paper, in which he stated that he had abandoned this type of roller bearing.

Dealing with the end thrust trouble, Prof. Goodman said if the rollers were not absolutely parallel with the shaft, or if the rollers were the least bit taper, or if the shaft or sleeve on which it rolled was taper, the rollers tended to roll in a helical path on the shaft as it rotated. But the rollers could not actually roll in a helical path continuously, for the simple reason that the cage or ends of the casing prevented them doing so.

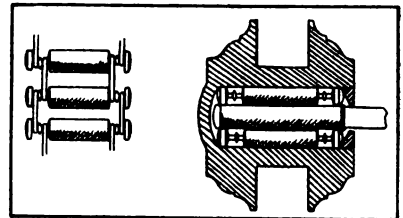


Fig. 2—Early Type of Roller Bearing.



Hence the rollers did not grip endwise until they pressed hard on the end of the cage and on the flange of the casing; then when the end pressure became sufficiently great the rollers slipped and started afresh to roll in a helical path and slipped back. By a very simple arrangement of his

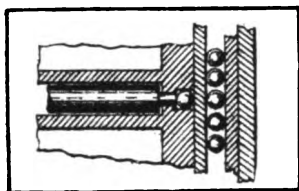


Fig. 3—Combined Ball and Roller Design.

testing machine he (the lecturer) was able to show that the movement of the rollers was in a helical path; that the rollers moved a certain distance, and then slipped back, over and over again. The amount of the end thrust depended very largely upon the load on the bearings. As far as he was able to detect it, it did not vary at all with the amount that they were out of truth. This end thrust caused very serious trouble. First of all, the rollers wore right through the end of the cage—drilled holes right through the casing. He had seen many instances of this. It was an action that caused very serious rumbling—a vibrating action which enormously increased the friction of the bearing. If one could get a pure rolling motion of the rollers without end thrust the coefficient of friction would be somewhere in the neighborhood of one in 1000, whereas with end thrust it might easily be one in 200 or 300; and the end thrust itself was very serious, as it might easily amount to from a quarter to one-third of the total load on the bearing. When one came to think of it, it would be seen how very serious it was. With a 10-ton load on a bearing one might get from 2.5 to three tons end pressure on the rollers and end pressure on the shaft tending either to the right or to the left. The direction of the end thrust always reversed when the direction of rotation on the shaft was reversed, but in certain cases it was very erratic. Sometimes the end thrust would be easier for a few minutes, then get up to its maximum, and then reverse its direction. It was almost impossible to say beforehand in which direction the end thrust would occur, or what the amount of it would be.

#### Anti-Friction Rollers.

The next slide showed another early type of roller bearing, known as the anti-friction rollers. They were largely used in the early days, and even to the present day they were occasionally used in certain cases.

It was quite impossible to do anything with them for big loads. The end thrust of the shaft was very serious, and when testing it in the testing machine he was obliged to put a ball thrust bearing on in order to prevent the shaft from moving endwise. As the shaft rotated it would press endwise, and when reversed it would go in the other direction, and there was no option but to fit a ball bearing for thrust. A somewhat similar bearing had been recently applied to railway vehicles, but instead of two rollers it had a single roller with the shaft immediately above the main axle and guides to keep it in a vertical position. One railway company had had 10,000 or 12,000 wagons fitted with these bearings. He was walking over that particular line recently with the engineer, and asked him how they were doing. The engineer said they were doing very well indeed, giving no trouble at all. They came to a siding a short time afterwards, where there were some of these wagons, and he (Prof. Goodman) said, "You have one of those roller bearings there; I will have a look at it". There were 40 or 50 wagons standing idle, every one of them out of use because of the almost utter impossibility of keeping the main axle dead true with the other axle, the result being that there was a very serious amount of end thrust, and in some instances it had worn right through the casing. He did not deny but what some of them had worked successfully, but a great many had not.

#### Overcoming End Thrust.

Among the early tests that he made in order to overcome end thrust was one, Fig. 3, in which the ends of the roller were turned down and continued into the cage, and a ball inserted to provide the point against which the end of the roller could act. He used a ball because it was more convenient than to put a lathe centre. He had been adversely criticised for putting a ball there in that way, and had been told that he knew

nothing about friction, but as a matter of fact a ball like that would stand a very big load. He had found instances of vertical shafts carrying loads up to two tons without anything except an inch ball in the middle running on a plain piece of hardened steel. They had run for years and had given no trouble. Personally, he very much doubted it when he was told of it at first, but he had seen a great many instances of the same thing being done, and could vouch for the accuracy of the statement he made. With a small amount of pressure it answered admirably to take the end thrust. Two hardened rings and a cage were introduced. The arrangement was used mainly for experimental purposes, and a series of tests were carried out with the bearing without the ball and with it. The friction was carefully measured, and all the other particulars of the end thrusts were also carefully measured, and it was found that when the balls were interposed they reduced the friction by 30 per cent. or more, showing that a large amount of the total friction of the bearing was due to the friction between the end of the cage and the flange of the casing. That, of course, could be used in practise, but it was certainly inadvisable. They could get ball bearings and other types of roller bearings very much cheaper and better than that. It was simply done for an experiment, and answered the purpose as far as it went, in showing that end thrust was the cause of a good deal of trouble.

#### Ball and Roller Combined.

He then showed a roller bearing in which a ball bearing in a cage was put in to take the end thrust, and it answered fairly well, but he was not sure whether it was used at the present time. It added a little to the expense, and was not altogether satisfactory. It would be seen that even makers of roller bearings had been obliged to use some such method as that which he had described to take up the end thrust of rollers and on the shaft itself.

The next slide was a very cheap form of roller bearing (the Koppel), such as was used on small trucks for light railway purposes. No cage was used, and it was the very cheapest form of roller bearing that it was possible to get.

Very early in the history of this work, in making tests, he (the lecturer) found that much of the trouble with regard to end thrust was due to imperfect workmanship. He went to a firm who had a reputation for turning out the very best workmanship, and he asked them to make two roller bearings absolutely perfect, or as nearly perfect as they could, working to the ten-thousandth part of an inch in accuracy in all important points. They made two bearings, which were tested in the most accurate manner possible, and were found to be without fault; they cost their weight in silver. What he was then trying to find out was whether troubles due to end thrust could be avoided by accurate workmanship, because if accurate workmanship could get over the trouble it was simply a matter of making automatic machinery to produce bearings that were absolutely accurate. Unfortunately, these bearings gave no better results than the very cheapest bearings on the market. That at once conclusively proved that it was not a bit of good to talk about accuracy of workmanship, and that the ordinary type of roller bearing was hopeless.

#### Utilization of Short Rollers.

The next attempt was to use short rollers. It was thought that possibly long rollers bent to a certain extent under load, and that if short rollers were used makers might succeed in distributing the end thrust, some of it going to the left and some to the right, and so to a large extent overcoming the troubles. The results were better certainly. There was less end thrust and rather less friction with the short rollers than with the long ones, but it was by no means an unqualified success.

Another type of roller bearing which had been used to a large extent was the Hyatt roller bearing. In this

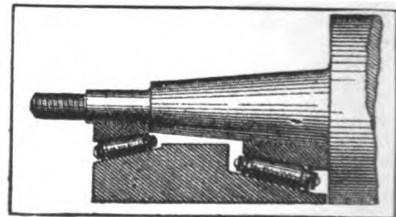


Fig. 4—Tapered Roller Bearing. Eliminating End Thrust.



case the rollers were made like helical springs, in some cases hardened and in some cases not; in some cases they were fitted on a steel liner on the shaft, and in others they worked directly on the shaft. These helical rollers were made, one with a left handed helix and the other with a right handed helix, in the hope that the one roller would tend to traverse to the left and the other to the right, and so overcome the thrust on the end of the bearing. To a large extent it was so, and for light loads these bearings had been a great success when used for line shafting. The loads they carried were very, very small for a bearing of one square inch section as compared with high class roller bearings or a ball bearing. That was one of the difficulties connected with them, although for ordinary purposes—such as shafting—they were quite satisfactory.

When in America a few years ago he was on the lookout for some of the American roller bearings. He bought one from a firm who guaranteed that it produced no end thrust whatever. Personally, he was a little bit doubtful, and when he came to test it in the testing machine it smashed the end thrust gear altogether. He had it strengthened, and it smashed it a second time. He took it out then, and thought that this firm had really overcome the trouble, but that idea proved to be incorrect.

#### **Tests of Timken Bearings.**

There was another roller bearing recently put on the market, in which the length of the roller is equal to its diameter; it ran in a hardened steel, beautifully ground sleeve, and had a hardened steel liner. The rollers also were hardened and ground up to the same degree of accuracy as balls were in ball bearings. It was the only one he had known that was anything like satisfactory. The end thrust was very small. The one he tested had a little end thrust at first, but after a few weeks the end thrust disappeared entirely. He kept on running it for over a year, and ultimately managed to make it fail, but at a very much higher load than a ball bearing of the same size. If they came to examine carefully into the movement of this tapered roller, Fig. 4, in regard to its sleeve, they would be able to understand why there was no end thrust. The motion of the sleeve and roller tended to crack the sleeve. It was the only case in which a roller bearing was practically free from end thrust. This particular bearing—the Timken—was interesting to the automobile industry. He carried out some tests some years ago, and they worked out extremely well. He was told that in actual practise on automobiles it did extremely well, but he had not had any experience of it in that connection.

#### **Disadvantages of Conical Rollers.**

He next showed a thrust roller bearing with conical rollers. The rollers were far, far too small. As he would be able to show, the safe load on which bearings would run depends as much on the speed of the shaft as upon the speed of the rollers. He had one of these bearings sent him to test, and was told that it was going to be put into a pleasure yacht, but that the owner wished it to be tested before having it fitted. He (the lecturer) was instructed to put a certain load on it at a certain speed, but he knew it would not carry the load at the speed required unless all his formulae were wrong. He put it in on half the specified load, and it gave rise to an interesting pyrotechnic display for a few minutes—after the manner of a Catherine wheel—but as that was not the purpose for which it was intended it was never put into the yacht. Other bearings of this type and size had been used, but the outward thrust of the rollers tended to burst the cage and ring.

To sum up the end thrust troubles: (1) the pressure on the bearings was enormously increased, due to end thrust; (2) the wear was very serious—he could give many instances of the large amount of wear that occurred with bearings having a large amount of end thrust; (3) there was a large amount of rumbling vibration—some years ago he put roller bearings in a factory in Leeds in which there was some chemical works carried on in the upper story, and after the bearings had been installed a few months very serious complaints were made with regard to the shafting. The complaints were that the vibration was so great that the bottles used to get shaken off the shelves in the chemical department above, and they were obliged to take out the roller bearings and substitute ordinary bearings for them, which effectually put an end to the trouble.

With some types of roller bearings only there was considerable end thrust. With a properly designed roller

bearing, in which there was no end thrust, the friction was to all intents and purposes independent of lubrication, but when there was a large amount of end thrust then lubrication made a great difference, for the simple reason that when there was no end thrust there was a pure rolling action, but when there was end thrust there was a large amount of friction between the ends of the cage and the flange of the casing. Then lubrication did good. With a roller bearing of nearly pure rolling action lubrication was practically of no effect. Then the friction was almost independent of speed in good roller bearings, but it decreased somewhat with the speed when there was end thrust. In all roller bearings, bad and good, the starting effort was very little greater than the running effort, which was a very great point in their favor, especially for certain types of machinery where they were constantly stopping and starting, and in general, even with the worst roller bearings, the friction was lower than in ordinary bearings in which there was bearing lubrication, but running them in a bath of oil effects a considerable improvement.

#### **(To Be Continued.)**

Ed. Note—The next installment will contain the report of Prof. Goodman's lecture on ball bearings, etc.

## **CONDITIONS NEVER BETTER.**

### **President of Premier Company Is Decidedly Optimistic as to the Future.**

That there never was a time when the automobile business promised a more healthful future than now, is the opinion of H. O. Smith, president of the Premier Motor Manufacturing Company, Indianapolis, Ind. He feels that the development period through which the industry has passed was costly, a great deal of ground having been covered in a few years. Concerning this phase of the subject, he has the following to say:

The automobile of today would not have been a possibility, and the automobile business could not be where it is today if this industry had fallen into the hands of pessimists. It required an optimist, one who could see visions of the future. It has attracted the most alert and skilled engineers of the world, as is amply verified by the great accomplishment in the developments over a brief 10 years.

A review of what has been done, the various ideas which have been taken up and exploited, will reveal the fact that less than five per cent. of the ideas introduced into the several makes of cars at various times, has survived in any form, and, on the other hand, it is startling to note how many of the features which characterize the most up-to-date cars made their appearance in the early stages of the development of the industry. This cannot be attributed to intuition or luck, especially where practical engineers had foreseen and carefully worked out these ideas.

A healthy future can safely be predicted for the automobile business, as it has finally found its place among the large and important industries of the period. The experimental or development stage has been passed, with its extraordinary expenses, and for the future we can only foresee such changes in the fundamentals of motor car design as tend toward further refinements and economies. The business may be said to be safer because of the fact that its gross margins have been reduced to normal, and it no longer attracts the "get rich quick".

The licensees of the A. R. Mosler Company, Mount Vernon, N. Y., under the Canfield patent, will complete the organization of spark plug manufacturers at a meeting in Chicago, Jan. 29.



## MECHANICAL NOTES FOR OWNERS.

### Practical Jack Block, Permanently Attached to Rear Spring, for Preventing Slipping When Jacking Up Wheel---Novel Valve Stem Adjustment---Heating the Fuel.

WITH some types of rear axle, especially when a transverse tie or strut rod is utilized, difficulty is experienced in locating the head of the jack so that it will not slip when a wheel is being raised from the ground, etc. It is not good practise to place the head of the jack under the rod or the spring. In the first named instance, the rod is likely to become damaged, as it is not designed to carry heavy loads. With the jack placed under the springs, there is always more or less chance of the jack slipping, and if a wheel has been removed, considerable damage would be likely to result if the spring slipped off the jack.

An English accessory maker has brought out what he terms a jack block, which is shown at Fig. 1, and the design is so simple that it would be an easy matter to construct one on similar

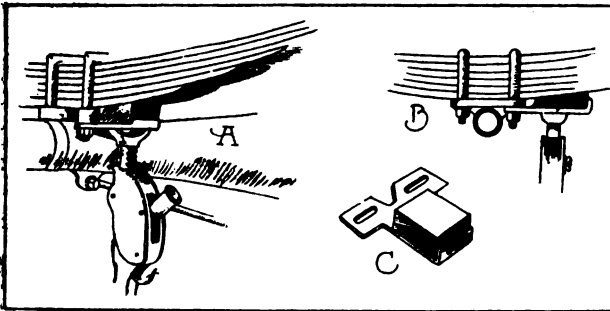


Fig. 1—Jack Block for Attachment to Rear Springs, to Prevent Head of Jack from Slipping When Raising Wheel, Etc.

lines and at a slight cost. It is depicted at C, and consists of a flat metal plate having a slot, also two holes to register with the spring clips of the car. One end of the plate is upturned to carry a wedge shaped wooden block, made to conform to the pitch of the spring. The block is secured to the plate by means of screws.

To fit the jack block, it is slipped under the spring clip as shown at A, and the nuts tightened. The piece of wood, by reason of its shape, fits snugly against the under curvature of the leaf spring, while the metal plate provides a flat, horizontal surface against which the head of the jack can be placed. The jack block is, of course, a permanent attachment. The central slot is provided to clear the web, which is cast with the spring pad. The jack block with jack is shown at B,

and it is obvious that the device eliminates opportunity for slipping.

#### ADJUSTABLE VALVE STEMS.

The owner who desires to obtain maximum mileage from his fuel should give a number of components of the chassis attention and eliminate causes making for inefficiency. Improper valve timing, that is, too much space between the valve stem and tappet, means a waste of fuel because of too late openings. The modern motor is provided with means for compensating for wear, the tappet or pushrod generally being made adjustable, so that it can be lengthened or shortened as best meets operating conditions.

There are, however, a number of early models, the pushrods of which are non-adjustable, and some of these have guides which do not permit of alteration to fit adjustable means. The following method of providing the adjustable feature is contributed by a reader and is interesting in that the valve stem provides the adjustable feature, not the tappet:

I am enclosing a rough sketch of a plan I adopted for making the valve of my motor adjustable. There was considerable space between the valve stem and the pushrod, resulting in the valves opening too late and the motor lost so much power that many hills formerly taken on the high called for a drop to the second gear.

The bushings or guides were too high on the pushrod to permit of fitting adjustable bolts and nuts, and as the bearing was small at the best, I did not deem it advisable to reduce it. There was a fairly good amount of space under the retaining valve spring collar or washer, and as the valve springs had been in service for several years I believed that they had lost much of their efficiency.

To obtain room for the adjustable mechanism (shown at B, Fig. 2) I removed the valves and springs and cut off a spiral of the spring. This necessitated cutting a new slot for the key, and I also drew the temper of the end of the valve to permit of cutting a thread.

The sketch at B will explain how the adjusting mechanism was obtained. The part that comes in contact with the pushrod was made of a piece of steel and hardened. The length of thread on the valve stem is exaggerated to show the idea. The locking nut was made fairly thin, and when the parts were assembled it was an easy matter to make the required adjustments.

#### HEATING THE FUEL.

In these days of the high cost of fuel considerable attention is being given to the development of devices which will raise the temperature of the gasoline. A large number of car manufacturers utilize the heat of the exhaust, conveying



it through flexible metallic tubing to the air intake of the carburetor, to heat its jackets. A reader contributes the drawing shown at Fig. 3, and the application of the heat of the exhaust is novel, to say the least.

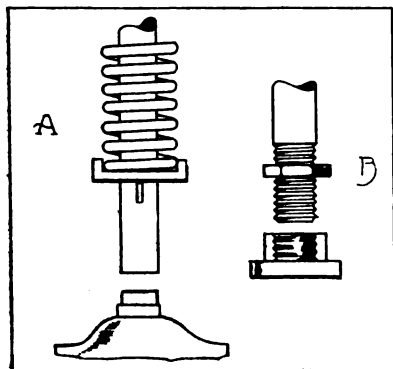


Fig. 2—Fitting Adjustable Means to Valve Stems.

Noting a method of using the heat of the water jackets by means of a pipe run through the intake manifold of the motor in a recent issue of your magazine, I conceived the idea of employing the heat of the exhaust, but in a different manner, as will be noted by the drawing I am sending you.

I believe that if the exhaust can be used for the air of the carburetor, beneficial results can be secured by having the fuel

sufficiently warm. It is well known that in summer no trouble is experienced with the gasoline but when it is cold it does not vaporize readily. Hence the use of water jackets, heat, mixing devices, etc. Heating the fuel in the float chamber is held to be good practice, but why not go a step further and heat the gasoline before it enters the carburetor as well?

In putting my theory into practice, I used .375-inch annealed copper tubing, tapping two places in the exhaust pipe, as shown in the sketch. The pipe was fitted by means of threaded bushings. Although considerable trouble was experienced in bending the tubing, the work was finally accomplished by beginning with a few turns about the carburetor, then using a rod for the fuel pipe.

I believe that I obtain much better results, as the fuel pipe is kept warm, raising the temperature of the gasoline before entering the float chamber, as well as that in the carburetor.

The practicability of the plan suggested would depend upon how much heat could be obtained through a .375-inch tubing, and especially where a number of coils are employed and the pipe is of such length. It would appear that the better method would be to utilize the hot water from the water jackets, connecting the pipe in such manner that the fluid would be circulated by the pump. Raising the temperature of the fuel before reaching the carburetor is a point worth considering. Perhaps some of the readers of this department have some suggestions to offer as to improving vaporization of the fuel.

### TIRE INFLATION.

The value of keeping the tires inflated to predetermined pressures, those recommended by the maker, is acknowledged by the experienced motorist. Heretofore the various manufacturers have practically agreed upon the pressure for a certain size casing, but several changes are noted in the announcement made by the Goodyear Tire & Rubber Company, Akron, O., maker of the

well known Goodyear tires and inner tubes.

The company recommends that its 1914 six-inch casings be inflated to 100 pounds instead of 120, the 5.5 to 100, and the five-inch to 90. "Considerable scientific testing preceded this apparent concession to lower inflation and easier riding", states the company.

Tire makers recognize that the destruction of an under-inflated shoe is brought about by an excess of flexing or bending. A soft casing has its side walls contracted and expanded each time a complete revolution of the car wheel is made, a condition generating heat and resulting in breaking the fabric. A tire properly inflated is not subjected to as much destructive flexing in a year as one not properly inflated in a week, claims the Goodyear company, which points out that an under-inflated shoe, striking a stone or car rail, may have its top and bottom brought together in a blow hard enough to crush or break the fabric at once. The smaller the casing, the sharper the flexing angle and the shorter the distance between the top and bottom when impact occurs.

Careful investigation has led the Goodyear company to conclude that in a five-inch casing the angle of flexing under ordinary inflation is small enough to allow a lower proportionate air pressure than recommended with small tires, and the new figures are included in the company's latest tables of tire pressures.

An experiment to illustrate the principle involved is suggested by the Goodyear company. Take a small wire three inches long and another six long. Bend each in the middle to the same angle. Then bring the ends of each wire an inch closer together than at first and compare the sharpness of the angles at the centre. Consider

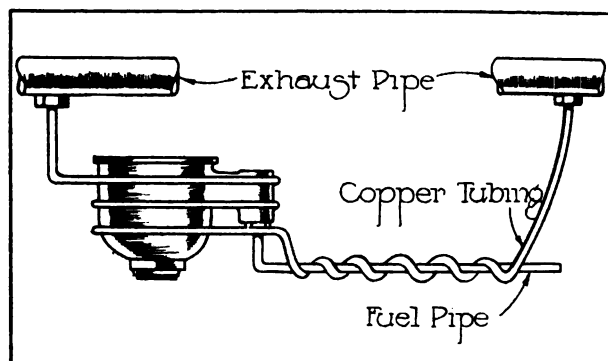


Fig. 3—Suggestion of Reader for Utilizing Heat of Exhaust for Raising Temperature of Fuel Before and After Entering the Carburetor.

that the three-inch wire is a three-inch side wall, and the six-inch wire a six-inch side wall, and the reason why under-inflation destroys tires is made clear.



## ANALYSIS OF MOLINE-KNIGHT TEST.

**T**HE full importance of the 337-hour test, to which the Moline-Knight motor, made by the Moline Automobile Company, East Moline, Ill., was subjected recently in the laboratory of the Automobile Club of America, New York City, is not indicated by the official report of the engineers in charge of the test, which was presented in the issue of The Automobile Journal for Jan. 10. Accompanying illustrations set forth details which were only partially touched upon by the report.

The test virtually was divided into three parts, the main portion, and that which constitutes a record, being the 336-hour continuous run from Dec. 19 to Jan. 2. Short runs were held before and after this period to determine other essential factors respecting the motor. The work

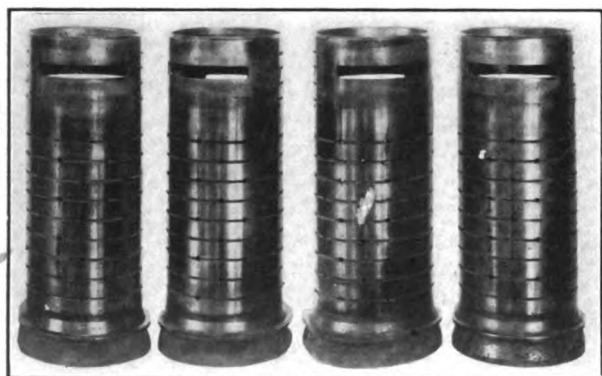
mediately after the completion of the test, and set forth in a decidedly comprehensive manner the effect of this strenuous trial upon those components which were expected to reveal the greatest amount of wear, etc.

It may be well to interpolate at this point that the Moline-Knight motor is a four-cylinder unit, with cylinders cast en bloc. It has bore of four inches and stroke of six, giving it a horsepower rating of 29.16 under the S. A. E. formula. The two sliding sleeve valves, one of which is within the other and both between the cylinder wall and piston, have inlet and exhaust ports, or slots, on opposite sides. The sleeves are actuated by short connecting rods, operated from a common eccentric shaft, and have a travel of 1.125 inches. The eccentric shaft and magneto are driven by silent chain from the camshaft. The weight of the complete motor and parts, as given by the engineers conducting the test, is as follows:

|  | Pounds       |
|--|--------------|
| Four pairs connecting rods, including gas tank pressure pump .....   | 10.6         |
| Four inner sleeves and pins.....   | 36.5         |
| Four outer sleeves and pins.....   | 30.4         |
| Four pistons with wristpins and rings.....   | 15.8         |
| Four connecting rods, complete with bolts and nuts .....   | 22.7         |
| Four cylinder heads.....   | 27.3         |
| One cylinder casting, with studs and nuts.....   | 130.4        |
| One cover for cylinder, four syphon tubes, four fibre insulating tubes and four lock nuts and washers .....  | 7.8          |
| One carburetor .....   | 6.0          |
| Four spark plugs and gaskets.....  | 1.1          |
| One fan with support and breather pipe.....  | 7.9          |
| One flywheel .....   | 116.6        |
| Intake water manifold .....  | 4.5          |
| Lower half of crankcase, bolts and nuts.....   | 31.0         |
| Chain case cover, oil pumps and pipes.....   | 9.6          |
| Top half of crankcase, including extension over clutch and transmission, crankshaft, magneto, magneto wires, air pump for gas tank, oil pipes, chain, sprockets, bearings, studs and nuts..... | 232.5        |
| <b>Total weight.....</b>   | <b>690.7</b> |

The cooling system also is of interest. The cylinder heads are covered by a removable plate over the four cylinders, providing ample water space between the cover and head. Circulation is by thermo-syphon. An equal flow of cooled fluid from the radiator is assured by the use of an intake manifold having two branches, one leading to the forward end and the other to the rear end of the lower edge of the cylinder block. The cooled fluid passes upward along the cylinder barrel, then around the intake and exhaust manifold, thence to the cylinder head and through the upper manifold or cover plate.

The motor is lubricated by a pressure feed system, which operates as follows: Oil is drawn from the sump by a gear pump driven off the



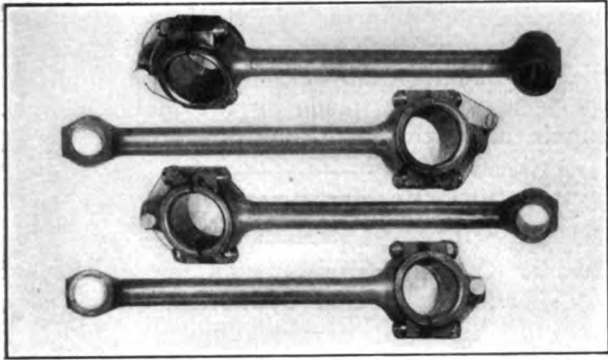
Showing the Condition of the Intake Ports of Four Sleeves After Two Weeks' Running.

done during the two weeks was equivalent to driving a fully equipped Moline-Knight car at a constant rate of 45 miles an hour on a level for 14,700 miles, or a steady climb up an eight per cent. grade at a constant speed of 27 miles an hour for 10,000 miles. The former distance is equal to 14 trips between New York City and Chicago, or five complete transcontinental tours from the Atlantic to the Pacific, or a journey entirely around the world on a line parallel with Edinburgh, Scotland. These facts should be borne in mind when considering the results obtained with respect to the conditions of the various parts of the motor at the conclusion of the test.

The average motorist is unable to gain practical information from tabulations and charts exclusively. These have value for the engineer and enable him to judge accurately concerning the performance of the motor under test. The photographs reproduced herewith were taken im-



end of the eccentric shaft, and is delivered to the three main bearings and the magneto shaft bearing under pressure determined by the settings of



**Connecting Rods, Presenting Excellent Condition of Grooveless Bearings at End of Test.**

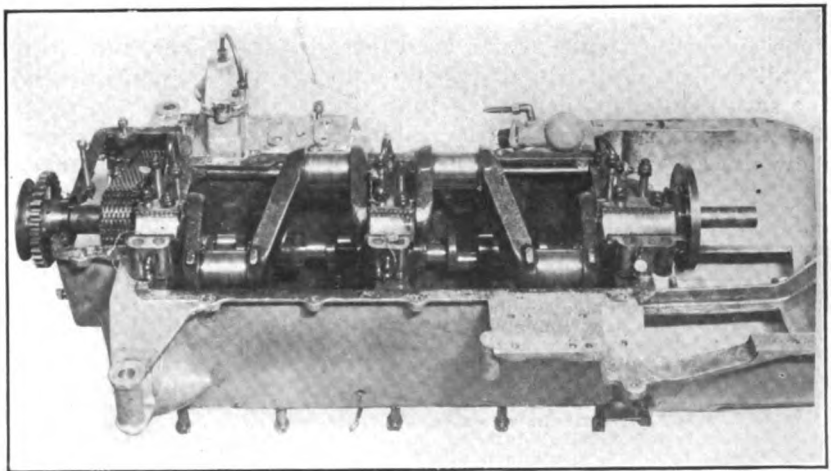
a spring controlled by-pass valve, through which the excess oil is delivered. This excess oil is led to the chain driving the eccentric shaft and magneto, and flows thence to a trough and through a screen to the sump. Part of the oil delivered to the main bearings passes through holes in the crankshaft web to the crankpins and thence through the tubular connecting rod to the hollow piston pins. From the two ends of the latter it flows to the sleeves and is distributed through holes and oil grooves in these over their circumference and the cylinder walls. All parts requiring lubrication not mentioned above are oiled by splash from the crankshaft and connecting rods.

The flow of oil delivered under pressure is determined by a valve which is so connected as to open and close with the throttle. This valve was wide open in all of the tests under discussion. There are no oil grooves in any of the crankshaft bearings. The entire bottom of the crankcase is covered by a screen, through which the oil returns to the sump. On this screen, and in that of the trough mentioned above, there was some carbon and dirt, strained from the oil, at the close of the test. A similar deposit was found on the chain case cover under the point where the combined breather and filler are located. The accumulation had evidently not interfered with the lubrication in any way during the test.

As stated in the report, the various parts of the motor, without exception, were found to be in

excellent condition at the completion of the test. Herbert Chase, laboratory engineer for the Automobile Club of America, who was in charge of the test after the motor was delivered to the club by the Moline Automobile Company, stated to the writer that there was absolutely no sign of undue wear at any point. The report says that there was no perceptible wear on the bearings, sleeves or other parts. The slight irregularities in the sleeves were found to have been built up with carbon to form a close fitting, glossy surface. The ports in the sleeves were not burnt, and there was only a very slight deposit of carbon on the port edges. The cylinder heads and the tops of the pistons showed only a very thin coating of carbon, and only small quantities of carbon were to be found elsewhere. No shake could be felt in any bearing, and there was every indication of perfect lubrication. There was not a single ring in either piston or cylinder head which was not perfectly free. The running of the motor with respect to noise and vibration was not appreciably different at the end of the test from that at the start and early hours.

Incidentally, of course, this test was of importance in demonstrating the reliability and efficiency of the accessory equipment, including carburetor, magneto and spark plugs. The carburetor was a Schebler, made by Wheeler & Schebler, Indianapolis, Ind. The ignition was by a Bosch DU model 4A duplex magneto and four Bosch plugs, made by the Bosch Magneto Company, New York City. The plugs were with heavy three-point electrodes, and concerning these the report states none was taken out of the



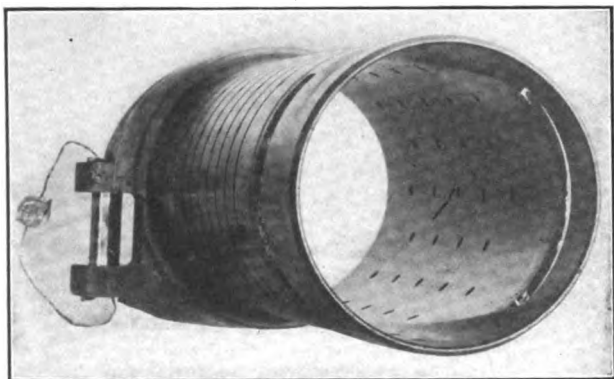
**Crankcase, Crankshaft and Bearings as They Appeared After Endurance Test—All in Excellent Condition.**

cylinder or otherwise disturbed until after the endurance test was completed. The electrodes were partly burned away, so that the gap was in-



creased, but the regularity of the firing was notable throughout.

It will not prove amiss in this connection to suggest that the advertising and publicity men connected with the industry must possess more than the average ability to secure for the product which they represent the attention they desire in the daily press. This test was a remarkable example of the ability to discern what the public wants in this regard, and full credit for arranging and carrying out the plans incident to what was destined to be the most strenuous and exhaustive demonstration, as well as the longest in point of time, to which any motor, regardless of type, ever has been subjected, must be accorded to Leon M. Bradley, advertising and publicity director for the Moline Automobile Company. Although Mr. Bradley is one of the youngest advertising men in the industry, he has been connected with it from its inception, and he is to be congratulated



Indicating the Slight Deposit of Carbon on Exhaust Port of Sleeve at Conclusion of Test.

upon achieving results which are eagerly sought by all men in his position. So pronounced was the success in a publicity way that Mr. Bradley was asked to summarize the results from this viewpoint. He said:

Modern methods and the present day knowledge of the motor car among owners and the trade permit the general prints to use but a limited amount of even good publicity. To secure effective and lasting advertising through the editorial columns, it behooves the publicity man to go to extremes in building up ideas. It is not general or ordinary industrial news, or what the ordinary car will accomplish, which will permit the advertising man to supply the class of information that will be sought by editors. In short, my plans are to supply to the press, both trade and daily, information which will contain 100 per cent. news value, and that which is unquestionably of general interest to every thinking man. Furthermore, I so planned this test that I did not have to seek publication, with the result that in two weeks' time we were able to demonstrate that the Moline-Knight engine had every advantage claimed for it, and that any car equipped with this type of power plant was standard. We feel that we have done every interest in the industry a wonderfully good turn, and only wish that we could receive from the test and promotion work of others the benefit we have accorded them.

It may be added that the Moline Automobile Company, through Mr. Bradley, has posted \$10,000, in a challenge to all makers of poppet valve motors, regardless of price, piston displacement, horsepower or number of cylinders (sixes preferred) to place their engines in the laboratory of the Automobile Club of America and duplicate the world's record made by the Moline-Knight engine, under the same conditions.

### NOVEL OIL CONTAINER.

#### Invader Oil Company Offers Compact, Sealed and Leak Proof Cylindrical Can.

The experienced motorist insists on the same brand and grade of cylinder oil in purchasing when away from his garage, and many owners make it a practise to carry a reserve supply of lubricant in the car. It may be that the oil will not be used for some time, and with the usual containers there is more or less opportunity of leakage, a condition that soils the tool box and its contents.

The Invader Oil Company, 80 Broad street, New York City, is marketing its product in a novel container, which resembles a flat nosed six-pound shell, or a thermos bottle. The bullet like tin is sealed by a soft soldered cap, such as is utilized on various kinds of tins holding fluids and solids. To use the contents the soldered cap is pulled off.

Each container holds a quart of the high grade oil marketed by this concern, and the grade of lubricant is marked on each can. The design not only makes for convenience in storing in the car, and cleanliness, but it insures the purchaser against receiving other than the lubricant called for.

The company states that it is the first time that cylinder oil has been put up for safety and convenience in transportation and application, in a neat, attractive appearing, lithographed, safe container, in just the bulk generally used. The slight additional cost is a negligible factor when the convenience and economy are considered. The new container should appeal to those who carry a small line of automobile supplies, as well as to the garage and service station.

The Schenectady Automobile Club, Schenectady, N. Y., has elected the following officers: President, William Demming; vice president, W. W. Wemple; secretary-treasurer, Roland Ford; governors, the officers and Albert G. Davis and J. R. Magarvey.



## REMAGNETIZING MAGNETO MAGNETS.

THE remagnetizing of magneto magnets is generally left to the maker of the instrument, and that is, perhaps, the best plan, as the manufacturer has special equipment for the work. A method of remagnetizing is given in the Commercial Motor, and the repairman contributing the suggestion was awarded first prize by the publication. The apparatus and wiring diagram are shown in an accompanying illustration, and it will be noted that two storage batteries are utilized, also two bulbs.

To make the apparatus two pieces of soft iron are employed, about six inches long and about 1.25 inches in diameter. These are used for the cores. The base is constructed of a piece of mild steel plate in which are tapped two .5-inch holes and these are threaded to take one end of the iron core.

Before screwing the core pieces in position, they are wound with an equal number of turns of No. 22 gauge insulated copper wire, the ends being left free. To these are attached four terminals. The wires are connected up to a pair of storage batteries as shown, and the latter are so wired that the polarity of the soft iron cores, indicated by the compass needle, is north and south respectively.

The inventor of the apparatus states that should the coils show signs of overheating, one or more lamps should be placed in each circuit to introduce resistance. Before beginning the work it is essential to ascertain the polarity, and this is accomplished by the aid of a compass needle. The magneto magnets must next be marked north and south, respectively, before there is any opportunity of reversing the process by confusing the poles.

To use the apparatus it is stated that it is only necessary to place the magnets with their opposite poles in contact with the cores, until they have absorbed sufficient magnetism to enable them to sustain a weight of 10 pounds, after which they are ready to be replaced on the magneto. In the drawing the magnet to be treated is the inner member.

### STARTING SEIZED PISTONS.

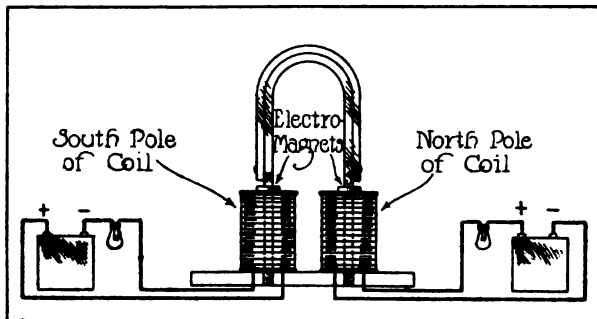
The following suggestion for starting seized pistons is made by a repairman: Place about a pint of kerosene in each cylinder, then jack one of the front wheels so that it clears the ground by at least two inches. Next place a jack under the

starting handle with the clutch section engaging with the crankshaft. Lower the jack under the wheel until the jack under the handle carries the weight of the machine. It is stated that this method will start the most obstinate piston.

### DETROIT ENFORCING LAW.

#### Thirty Complaints Filed in One Day Against Truck Drivers and Owners.

Although the provisions of the so-called fender ordinance in Detroit were held in abeyance until after the first of the year, because those upon whom the duty of enforcing the law fell felt that a suitable type of fender for commercial vehicles had not yet been placed upon the market, there is evidence that the authorities have now decided to enforce the ordinance literally.



Remagnetizing Magneto Magnets by Apparatus Designed by a Repairman.

In one day, during the week of Jan. 5, 30 complaints were filed against drivers and owners of trucks not equipped with fenders. So far as is known none of these cases has been prosecuted as yet, but it is expected that the defendants will maintain that they are unable to comply with the provisions of the law, and that it works an undue hardship upon them.

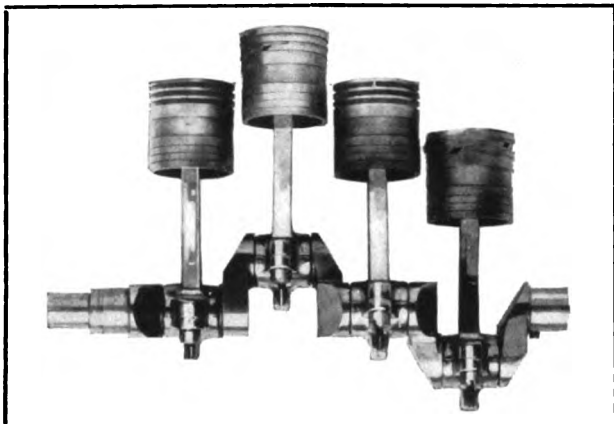
The Utica Automobile Club, Utica, N. Y., has elected the following officers for the ensuing year: President, Edgar B. Odell; first vice president, F. William Bensberg; second vice president, Charles Miller; secretary, John M. Rose; assistant secretary, George C. Donahue; treasurer, W. J. Childs.

Delegates representing 175 California automobile dealers met recently in Fresno for the purpose of organizing the California Automobile Dealers' Association.



## GEMMER STARTER, A MOTOR-COMPRESSOR.

**T**HE Gemmer Starter Company, 112 Ford building, Detroit, has brought out a new air motor starting system for both new and used



**Crankshaft, Connecting Rods and Pistons of Gemmer Air Motor Starter.**

cars, and the design presents interesting features, among which is the elimination of the distributor and piping to the cylinders, a construction generally employed with starting systems utilizing compressed air. It is the invention of G. A. Gemmer, formerly of the Gemmer Manufacturing Company, who conducted a series of experiments to obtain a compressed air motor starter which could be utilized without a distributor valve, tubing, etc.

The Gemmer air starter shown herewith, resembles the electric motor starter in appearance and some idea of its compactness may be obtained from the dimensions, which are given as eight inches long, eight high and four wide. One of the qualities of the Gemmer unit is that it may be utilized as a compressor for storing a tank or as an air motor to spin the crankshaft of a gasoline engine.

These qualities are obtained by driving the Gemmer through a suitable train of gears as a compressor, energy being supplied by the motor car's engine, and by reversing the operation the unit may be utilized to rotate the crankshaft of the motor. When used as a compressor the Gemmer may be driven at from 100 to 1600 revolutions a minute as desired, but when reversed, the ratio of drive is about 7:1, spinning the crankshaft at a speed of 150 to 225 revolutions a minute.

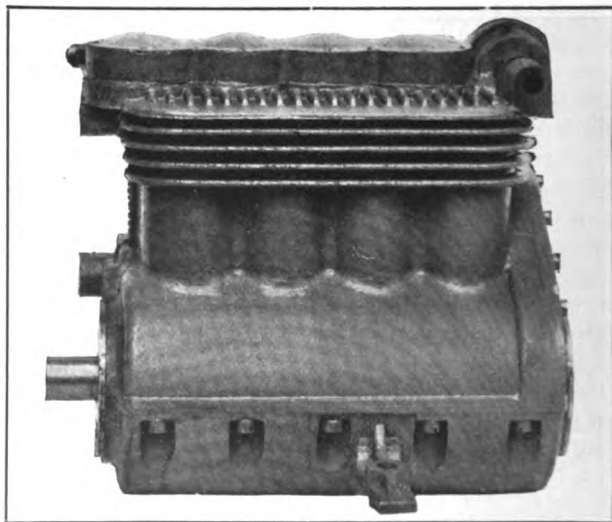
The operation of the combined unit is very simple. Depressing a button by the foot engages a clutch and gearing, setting the compressor into motion and charging a tank. When the

dash gauge indicates the desired pressure, say 200 pounds, the clutch is released and the unit is inoperative until replenishing the supply of air in the tank is required or the unit is utilized for starting.

For starting, a button is depressed, permitting air to flow from the tank to the unit, and it continues to spin the crankshaft of the motor until the engine starts under its own power, whereupon disengagement is made automatically. The unit is stated to be very efficient as a compressor, the maker claiming it will replenish the supply of air in the tank in five minutes. There is but one controlling valve, that located on the dash, and it is held to be positively leak proof. The piping plan is very simple, one pipe leading from the unit to the valve and from the latter to the tank. Particular attention has been paid to connections, etc., and it is stated that the pressure in the tank is maintained under all conditions.

The motor-compressor is constructed of high grade material and on principles indorsed by sound engineering practise. The pistons, rings, etc., are ground accurately to size, and the crankshaft is a drop forging of ample dimensions. All working parts are fully enclosed and dust proof. The mechanism is lubricated automatically from the crankcase.

The net weight of the Gemmer air starting system is about 55 pounds, and the inventor



**Gemmer Air Motor Starter, Which Operates as a Compressor and Is Reversed to Spin Crankshaft of Gasoline Engine.**

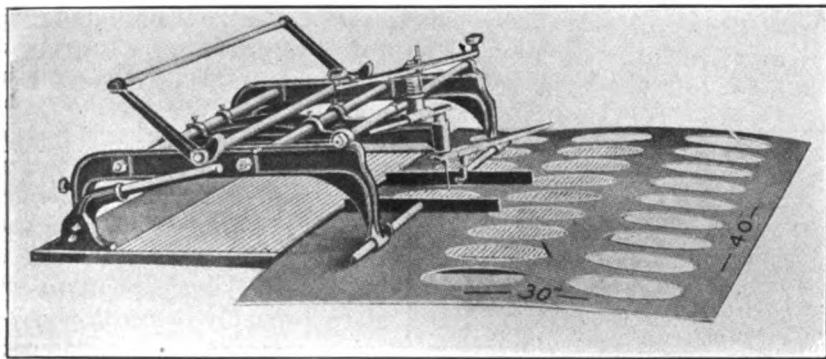
states that it is very economical of air, and that a large number of starts are possible with the tank filled. The design includes hose, etc.



### STARR OVAL CUTTER.

Cutting circular gaskets, etc., is a simple matter compared to oval members, and generally considerable time is required with the latter in order to obtain perfect work. The Shawver Company, Springfield, O., is marketing a practical device, for cutting ovals, termed the Starr-Springfield cutter, which is shown herewith. The No. 1 tool will cut any size circle up to 15 inches, and oval up to 15 by 22 inches. The No. 2 cuts circles up to 22 inches and ovals to 22 by 34 inches.

The bars are graduated by inches and fractions of fourths, permitting the operator to set the machine instantly to cut the size of opening previously determined. The machine is equipped with an automatic stop, limiting the downward movement of the knife, making it impossible to cut into the table top. The four corners have adjustments for raising or lowering, so that the



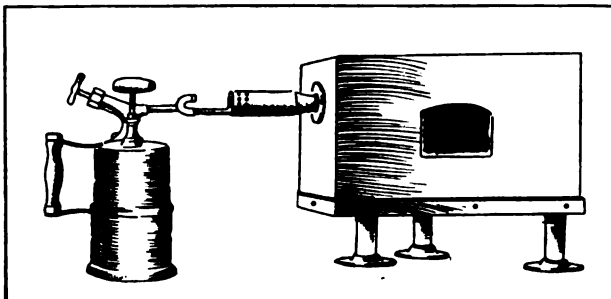
Starr-Springfield Oval Cutter, Which Will Also Cut Circles Up to 15 Inches.

machine may be levelled to conform to the table surface.

A quick acting clamp is provided for holding any thickness mat board up to .25 inch, and is quickly adjusted to any size opening. When the machine is not at work the clamp and its components rise from the table, a feature the maker states is not found in any other oval cutter. The complete equipment includes a cutting board, one wheel glass cutter, one embossing wheel, one knife for cutting 23-degree bevel edge, one knife for cutting a square edge, one stub knife for cutting long, narrow ovals, and a wrench.

### HAUCK KEROSENE TORCH.

The Hauck Manufacturing Company, 140 Livingston street, Brooklyn, N. Y., is marketing the Hauck patent kerosene torch, which is designed for general shop work and is held to be more efficient and economical than a gasoline unit. The



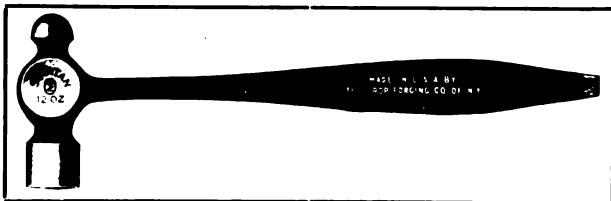
Hauck Kerosene Torch and Furnace.

maker states that the cost of operation is very low; that considerably more heat is obtained with kerosene than gasoline, and that the fuel is not only cheaper, but it is readily obtained. Another advantage in kerosene is held to be that it may be stored without restriction and is safer to use than gasoline.

The company states that its No. 14 torch will melt a piece of copper .5 by .25 inch, in three minutes, or a one-inch brass rod in two minutes. It is utilized in conjunction with a heating furnace, as shown in the accompanying illustration, providing a combination especially adapted for tool dressing, tempering, annealing and other heating operations. The furnace is 10 inches long, 10 wide and six high; made of cast iron and lined with a high grade fire brick. The company states its torches have been adopted by the United States government.

### SPARTON HAMMER.

The Drop Forging Company, Jersey City, N. J., is manufacturing the Sparton hammer, shown in an accompanying illustration, and the maker calls attention to the design, stating that it is particularly adapted to motor car work where a hammer, screw driver and tire iron are constantly required. It is also claimed that it has the essential qualities of a general utility tool.



Sparton Hammer, Combining Screw Driver, Tire Iron, Etc.



The Sparton is a one-piece drop forging of tool steel, properly hardened and tempered, and the metal is so distributed as to provide a good balance. The hammer head is so shaped that it gives an easy and positive grip when the tool is

being used as a screw driver or as a tire iron. The manufacturer claims a scientifically developed design of strength and durability, and the workmanship and material are guaranteed. The Sparton combination tool is moderately priced.

## NEW EMPIRE ROADSTER HAS ATTRACTIVE BODY.

**A**MONG the new attractive body designs displayed at the New York show was the streamline body fitted to the standard model 31 Empire chassis, made by the Empire Automobile Company, Indianapolis, Ind. The car attracted considerable attention, as it embodied features found on strictly high priced machines.

The streamline design begins with the hood, which in a graceful curve slopes to join flush with the sweeping deep cowl, under which is located the fuel tank. A one-piece windshield of ingenious design is fitted to the cowl. It is quickly converted into a rain or clear vision type, or may be tilted to cool the driver's compartment. The latter has a low, wide seat, and the uphol-

be displaced readily without dismantling the engine, etc. The headlights are provided with a dimming feature, and the tail light is a combination unit, oil and electric.

### TO HOLD FIELD DAY.

#### Maine Automobile Association Invites National Body for Summer Meeting.

At the annual meeting of the Maine Automobile Association, held in Portland, Jan. 15, it was decided to invite the American Automobile Association to hold a joint field day, probably at Poland Spring, some time during the coming summer. It also was voted to assist the Maine state highway commission in any manner which the commission might suggest in furthering the success of a big roads meeting to be held at some point in the state, probably in April.

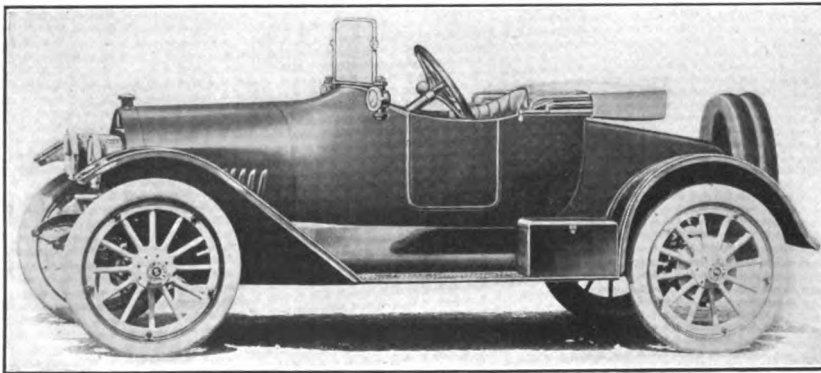
A committee was appointed to investigate the plan of working prisoners on the highways, and its members will take up the matter with the various county commissioners and ascertain the number of prisoners that would be available for

road work. The committee is composed of the following: A. Q. Miller, Auburn; Charles E. Hill, Belgrade Lakes; William N. Taylor, Portland. The following officers were elected:

President, Walter B. Parker, Portland; first vice president, Philip J. Deering, Portland; second vice president, Charles H. Fogg, Houlton; third vice president, E. J. Peacock, Lubec; fourth vice president, W. A. Hennessy, Bangor; fifth vice president, Forest H. Colby, Bingham; sixth vice president, John W. Hyde, Bath; secretary and treasurer, John Clark Scates, Westbrook.

Committee Chairmen—Good roads, Prof. George T. Files, Brunswick; touring information, publicity and contests, Daniel W. Hoegg, Jr., Portland; membership, J. J. Pooler, Portland; legislative, Charles E. Hills, Belgrade Lakes.

Directors—Hiram W. Ricker, Poland Spring; E. A. Doten, Portland; Charles E. Hill, Belgrade Lakes; W. N. Taylor, Portland; Silas B. Adams, Portland; Stanley Bisbee, Rumford Falls; Dr. Charles M. Sleeper, South Berwick; Charles S. Hichborn, Augusta; Leith S. Black, Houlton; Prof. George T. Files, Brunswick; David Talbot, Rockland; A. Q. Miller, Auburn.



**New Empire Streamline Roadster Shown for the First Time at the New York Display.**

stery is in keeping with the high grade material and workmanship characteristic of the product of the Empire company. The cushions are deep and comfortable.

At the rear is a commodious deck enclosed baggage compartment, providing ample space for baggage, supplies, etc., when touring, and for commercial purposes. At the rear of the compartment and opening upward is a wide door. The equipment of the new design is most complete, being identical with that of the touring car. An electric lighting and motor starting system is listed as extra.

The Remy equipment is utilized, it comprising a generator and motor combined in one housing. The installation is such that the unit may



## COPING WITH NEW YORK CONDITIONS.

SOMETHING of the work accomplished by the Manhattan Automobile Club, New York City, which was organized to cope with certain well defined conditions confronting the motorists of the Metropolis, is revealed in the address delivered recently before that body by Carl H. Page, one of the best known men connected with the distribution of cars in that centre. Extracts from the address are presented herewith for the double purpose of indicating, in a measure, some of the conditions which exist and the manner in which the club is adding to the industry by meeting them. Mr. Page said in part:

Conditions which have arisen in New York appear to me, and to some others of us who have made a careful study of them, to have become so general as to affect vitally the trade and the future of the automobile business, for the simple reason we have not had foresight enough to protect the owner in his investment in his motor car and provide for the proper protection of his pleasure, comfort and convenience in the possession and use of the same years ago. We have created a demand and have not had foresight to remove the difficulties which will some day stagnate the demand.

### Restricting Progress.

Now, therefore, let us for a moment study what these restrictions are and what causes these restrictions and how they may be removed, then put our shoulders to the wheel and remove them and in that way allow a demand to develop, which naturally will develop and did develop in seven years from nothing to the third largest industry in the world.

The Manhattan Automobile Club in a comparatively short life has already liberally demonstrated what a few people, interested in the common cause of making the automobile business better, can do. With very little money, provided by a few dealers and friends of the business eight months ago, and the abiding confidence in the future of the automobile business possessed by E. E. Schwarzkopf, to whom there is hardly one in the room who doesn't owe some obligation for the personal service he has rendered, as well as his determination to make some of us see to where we were drifting, this club came into existence with 50 or so members.

We have acted with the authorities in the study of the proper regulation of traffic conditions. We have curbed many instances of garage irresponsibility. We have studied the chauffeur problem and have a real plan to submit which will go a long way toward eliminating this most serious and hurtful condition. We have influenced highway officials to properly light and protect certain dangerous places (Columbus Circle). Have given study to upkeep expense and how it may be reduced, by demonstrating to the owner how he may cut out waste and wasteful methods. We have improved conditions on ferries. Have gathered touring information. Have laid out new ideal routes for next year to develop territories where cars now infrequently go, believing that the development of new territories will do for the automobile what the development of new territories has done for railroads, trolleys and other lines of business.

In fine, we have, with the co-operation of the best brains available on our committees, studied first, what the present owner needs to make his car more desirable to him, then what the non-owner needs to make him want a car, and have then made plans to fulfill each and all of their requirements.

### A Specific Instance.

Two instances will suffice to show the need of one owner and the need of one non-owner. The owner, the vice president of a big railroad, had in his family seven cars. His chauffeur ran into another car, killed a man and wife and permanently injured a little girl. The

owner was sued and lost a verdict of thousands. He was disgusted with automobiles, gave up his cars and his sons and daughters planned to give up theirs. In all, some 21 cars were affected and were to be put out of commission, all through the act of one chauffeur.

A member of the club heard of it, put him in touch with the club, and Mr. Schwarzkopf went to see him, convinced him that there was a body of men personally interested in his continued use of cars and could and would get him a good chauffeur—his dealer hadn't done so—if he was unable to get a good one for himself. In short, the man has bought one car and has ordered another and probably at least 10, if not more, cars are in commission today that would otherwise have been on the market for sale, and one big railroad vice president would be out telling all of his big friends that he was through with automobiles and advising them to be too.

### Another Illustration.

The other instance—a non-owner, went out to ride with a friend on a Sunday, with their wives, to see his friend's car and with the idea of buying one this week. A policeman stopped them on the Pelham parkway, asked the owner, who was driving, for his license. The owner told him he didn't have a license. The "Cop", to further humiliate him, said: "Don't kid me, you're a chauffeur and I know it—now I will add that to the charge", and he did. Monday, the owner and his friend, the non-owner, went to court. He was put in line with negroes, thieves and worse. When his turn came the judge called him a speed maniac, fined him \$50, saying "It is \$50 today, tell your friends it will be five days tomorrow".

This owner is a retired business man some 60 years old and has dignified the entire community by a life time of big business and high reputation. The owner and his friend, the non-owner, left the court together; the owner determining to sell his car at once, the non-owner giving thanks that he didn't yet own one.

### Club Fills in the Gap.

They went to a barber shop and happened to tell the barber. The barber told Mr. Schwarzkopf, and he got in touch with the owner, told him of the Manhattan Automobile Club, what we are doing and that we needed him and other owners to join us to protect him and correct such annoyances. He joined the club and is going to keep his car. Mr. Schwarzkopf got in touch with the non-owner, explained to him the movement we have started, reassured him as to what he might expect would be accomplished to avoid such experiences in the future and he will probably buy a car this week. One owner saved to the present business, and one prospect saved to the future business.

Now that the individual automobile owner is interested, let us put before him in a business like, systematic way what we have already accomplished and what we may accomplish in the future.

### Need for Co-Operation.

The private owner needs the same privilege to enjoy his car without the danger of wholesale arrests, etc., as the man who used to drive his carriage. The truck owner needs the proper regulation of traffic and other conditions so that he may use trucks successfully just as the owner of a horse truck has needed and had proper help in using his truck for years. The salesman needs more prospects to sell cars to; the dealers need more sales to make profits on. We all need these things. Not one of us can accomplish anything alone—but we can together. The salesman can find more prospects and the dealer more profits if we join together to give the man what he needs.

Let us open the door of this club to the automobile owner and bid him enter. The owner is the man who provides the money to buy our cars. Let us influence the owner to come here and meet with us just as you and I meet together. The owner can't accomplish anything as an individual—he doesn't know how to accomplish—what he needs is a club. But we do, and can, and will. Let us write him to join us because we can, and want to help him. It will, at the same time, be helping ourselves. And if we didn't years ago, when we were young in experience, when the industry was young in development and knowledge of the present need of the owner and the present conditions of the business was beyond us, have the foresight to do the things which now must be done, let us have the aftersight and do them now.



# NEWS OF THE MANUFACTURER AND DEALER.

The following concerns have been incorporated recently to manufacture or deal in motor vehicles, accessories, etc.:

**Dinsham Engine Tester Corporation**, New York City; \$50,000; to manufacture automobile engine tester; D. P. Gahabiall, Judson P. Welsh, P. M. Richards.

**Flyer Motor Car Company**, Minneapolis, Minn.; \$100,000; to build cyclecars; H. C. Campbell, G. C. Milne, Thomas Howard, A. A. Gloetzner.

**Roberts Gas and Gasoline Engine and Car Company**, Nashville, Tenn.; \$50,000; to manufacture engines.

**Iowa Cyclecar Company**, Des Moines, Ia.; \$10,000; Earl L. Lum and others.

**Resilient Auto Wheels Company**, Duluth, Minn.; \$50,000; to make automobile wheels; Arthur Jutila, Helmer Johnson, Osmond Thompson, A. W. Younkivist, B. E. Wellberg.

**Butler Auto Steel Wheel Company**, Butler, Penn.; to manufacture wheels for automobiles and trucks.

**Shaw Motor Company**, Chicago, Ill., Delaware corporation; \$1,000,000; to manufacture and deal in motors of all kinds; James W. Shaw, August Picking, Arno Meyer.

**M. Richard Automobile Company**, Cleveland, O.; \$250,000; to manufacture passenger automobiles.

**Klingelsmith Electric Truck Company**, Chicago, Ill.; \$350,000; to manufacture and deal in electrical vehicles; J. M. Klingelsmith, M. F. Cure, E. E. Tilley.

**Vaughan-Harris Company**, Vermillion, S. D.; \$25,000; to manufacture radius truss rods for automobiles; M. A. Vaughan, R. E. Vaughan, George O. Harris.

**Corsair Motor Company**, Dover, Del.; \$25,000; to manufacture and deal in trucks; J. M. Sattersfield, W. P. Carrow, M. M. Hiron and others.

**W. S. Truck Company**, Birmingham, Mich.; \$30,000; to build motor trucks; J. J. Welser, E. R. Smith.

**C. J. Cross Front Drive Tractor Company**, Newark, N. J.; \$100,000; C. J. Cross, J. W. Powelson, W. E. Holmwood.

**Washington Auto Parts Company**, New York City; \$1500; to deal in automobile parts; Joseph Dunn, Max Rosensky, Adolph Sachnoff.

**Cycle Car Company**, Wilmington, Del.; to manufacture cyclecars.

**Multi-Signal Company**, Kittery, Me.; \$100,000; to manufacture electric signals; H. Mitchell, H. A. Paul.

**J K Siphon Ventilator Company**, Little Rock, Ark.; \$100,000; to manufacture siphon ventilators.

**Kleiber & Co.**, San Francisco, Cal.; \$250,000; to manufacture motor trucks; Paul Kleiber and others.

**Signal Motor Truck Company**, Detroit, Mich.; \$60,000; to manufacture trucks; A. C. Burch, John Squires, R. Murray Wendell.

**Connecticut Aeroplane Company**, New Haven, Conn.; \$400,000; to build aeroplanes, etc.; E. A. Mulliken, Paul Webb, Ralph H. Clark.

**Haney Rescue Apparatus Company**, Tampa, Fla.; \$2,000,000; to manufacture automobiles, etc.

**Lexington-Howard Company**, Connersville, Ind.; \$150,000; to manufacture automobiles; E. W. Ansted.

**Pneumatic Devices Company**, St. Louis, Mo.; \$50,000; to manufacture door opening and closing devices; Nelson S. Gottshall, Henry B. Graham, John F. Bishop.

**American Electric Car Company**, Portland, Me.; \$1,500,000; to manufacture and deal in electrical and mechanical devices of all kinds and to deal in automobiles and parts thereof; A. F. Jones, T. L. Croteau.

**Tacoma Transit Company**, Tacoma, Wash.; \$30,000; to conduct a motor passenger service.

**Peoples Omnibus Company**, Atlantic City, N. J.; \$500,000; to operate omnibuses; N. G. Holmes, T. H. Smith, R. Harcourt.

**La Crosse Motor Company**, La Crosse, Wis.; \$10,000; to establish a transfer and drayage system; F. J. Nootzel, Herbert Lewis, W. H. Ristow.

**Automobile Sales Underwriting Company**, Petaluma, Cal.; \$100,000; to finance automobile dealers; Charles L. Clise and others.

**Motor Storage Company**, St. Louis, Mo.; \$250,000; storage of motor cars; H. B. Graham, H. S. Gotshall, W. J. Holbrook.

**Monarch Pattern Works**, Detroit; \$100,000; to manufacture wood and metal patterns and automobile ac-

cessories; John P. Park, Edward J. Swink, Herbert J. Chandler.

**Vaught Inspection and Service Bureau**, St. Louis, Mo. to inspect automobiles and trucks; C. C. Vaught, E. J. Dykstra, W. F. Horsting.

**Three Kays Company**, St. Louis, Mo.; \$2000; to manufacture carbon cleaning compounds; Rosie Olin, Edward Mendelsohn.

**Simplex Specialties Company**, Detroit; \$15,000; to manufacture and deal in automobile lifters, robe rails, accessories and parts.

**Clarke-Lorentowicz Company**, Newark, N. J.; \$100,000; to manufacture centrifugal pumps; J. Lorentowicz, G. H. Clarke, L. Lorentowicz.

**Reichenbach Patent Company**, Yonkers, N. Y.; \$250,000; to manufacture combustion motors; A. Schwartz, Thelma Joffe, Abram Breiband.

**Standard Mercantile Company**, Wessing Springs, S. D.; \$50,000; automobile and real estate business; L. F. Russell, W. T. McConnell, L. F. Aucman and others.

**Lucas Electrical Devices Company**, Chicago, Ill.; \$10,000; to manufacture electrical machinery and appliances.

**Teetor-Hartley Motor Company**, Hagerstown, Ind.; \$10,000; to conduct a general motor vehicle business; J. H. Teetor, C. N. Teetor, Joseph Teetor and others.

**Tanner-Howe Manufacturing Company**, Akron, O.; \$50,000; to manufacture gasoline gauges.

## GARAGE AND DEALER.

**The Rodney K. Haines Company**, New York City, will locate in its new and enlarged quarters at 1757-65 Broadway.

**The Folles Garage**, De Kalb, Ill., is now open to the public on South First street, where it has a new garage and machine shop, also sales and showrooms, 90x120 feet, two stories.

**The Capitol City Auto Company**, Hartford, Conn., has had its building remodelled. The company handles the Lozier and Mitchell cars.

**S. A. Foster**, Hartford, Conn., agent for White and Jeffery cars, has moved to 343 Trumbull street.

**The M-B-M Motor Company**, Boston, Mass., has moved to 41 Monroe street.

**Frederick W. Drostem**, St. Louis, Mo., has purchased the building at the corner of 12th and Locust streets and will remodel it for automobile purposes, at a cost of \$40,000.

**The Pathfinder Motor Car Company**, Minneapolis, Minn., northwestern distributor of the Pathfinder line of cars, has removed its quarters from 723 Third avenue, South, to 307 Sixth street, South.

**The Harter Automobile Company**, Sac City, Ia., has completed its large graage on North Fifth street, Marshalltown.

**The Knudson-Lurdblade Company**, Eureka, Cal., is planning to remove its Overland garage to the quarters of the Eureka Garage Company, having purchased the entire stock of the latter concern.

**The Kloeppel Motor Car Company**, Jacksonville, Fla., which handles the Reo and Lozier lines in that territory, has moved into larger quarters at 800 Main street. The new location affords ample room for a complete service station and supply warehouse.

**The George W. Browne Automobile Company**, Milwaukee, Wis., has moved into its new building at the corner of Broadway and Biddle street, where Overland, Stutz and Garford cars will be handled.

**E. B. Leverenz**, Milwaukee, Wis., has disposed of his garage and agency to Joseph Thor, who will continue the business in the same city.

**The Northwest Chevrolet Motor Car Company**, Portland, Ore., has taken quarters in the new Keats building. A. L. Smith is manager of the concern.

**The Detroit Slip Cover Company**, Detroit, Mich., has moved into its new salesrooms at 22 Hendrie avenue.

**The Knight Tire Company**, Chicago, Ill., is now located at 2112 Michigan avenue.

**C. V. Cairns**, Kansas City, Mo., has moved from 1304 McGee street, where K-R-I-T cars henceforth will be shown by the Motor Sales & Service Company.

**The Inter-State Automobile Company**, Kansas City, Mo., is now located at 1625 Grand avenue.

**The F. B. Stearns Company**, St. Louis, Mo., has leased



the two-story building at 3030 Locust street for a term of years and is now located at that address.

**J. W. Shelor and W. W. Morris, Jr.,** Dallas, Tex., have opened salesrooms at 2219 Commerce street for the purpose of showing Velle cars and trucks.

**The Western Minnesota Auto Company,** Roscoe, Minn., has moved to St. Cloud, Minn.

**George J. Bohem,** Sacramento, Cal., has opened offices and a service station at 1308 K street.

**The Kissel-Kar Branch,** San Francisco, Cal., has removed to the spacious new building on Van Ness avenue and Geary street. Kissel-Kar pleasure and commercial cars, Federal trucks and Ford cars will each receive the attention of a special department.

**The Oswald Auto Company,** Jackson, Mich., is now preparing to take possession of the new Oswald garage and salesrooms at 111-113 North Walnut street, where it will handle Imperial cars, to be distributed to north-western parts of the state.

**Charles F. Knuth,** Palmyra, N. Y., has opened a garage and repair shop at 10 Broad street.

**The F. B. Stearns Company,** Philadelphia, Penn., is now located at 247 North Broad street. The service department is in the same building.

**Thelma Motor Company,** Detroit, Mich., incorporated under the name of Rex Motor Company, will move its factory from 1200 Junction avenue to West Jefferson avenue, near River Rouge.

**Carl Lambert,** Ukiah, Cal., has opened a garage and machine shop at the corner of Stanley and Dora streets.

#### WITH THE MANUFACTURERS.

**The Pennsylvania Rubber Company,** Jeannette, Penn., has opened its new eastern branch at 1889 Broadway, New York City. The building provides 6000 square feet of floor space and extends from Broadway to Columbus avenue. The basement is to be used for shipping and adjustments. C. C. McCullough is manager.

**The Dominion Tire Company,** Berlin, Ont., has opened its new factory, constructed of reinforced concrete, one of the largest buildings of its character in Canada. The directors of the company are: D. Lorne McGibbon, Col. S. P. Colt, Victor E. Mitchell, Elsha S. Williams, A. J. Kimel, Homer E. Sawyer and T. H. Reider.

**The Puritan Machine Company,** Detroit, Mich., has opened a department for furnishing repair parts for the Michigan car, made by the Michigan Motor Car Company before its suspension. E. D. Edwards, formerly purchasing agent of the Michigan company, has been placed in charge.

**The Dean Auto Devices Company,** 120 South Sangamon street, Chicago, Ill., announces that in the future it will authorize every dealer handling Dean battery horns to replace any such horn which has become inoperative or imperfect in operation at any time within five years from date of purchase, upon the return of the original, accompanied by the exchange certificate.

**The Hood Rubber Company,** Boston, Mass., has sold the entire \$500,000 of preferred stock issued by directors, without any commission or underwriting, netting the company par.

**The Gallagher Carburetor Company, Inc.,** 1876 Broadway, New York City, has purchased the Edwards & Smith Company's foundries at Easton, Penn., and will operate under the name of the Lehigh Valley Foundries & Manufacturing Company, with head office in Easton.

**The Standard Welding Company,** Cleveland, O., has taken up the manufacture of wire wheels for automobiles in addition to the production of rims for motor-driven vehicles.

**The H. W. Johns-Manville Company,** New York City, has taken over the sales rights for the Arnold electric vaporizer and heating plugs, manufactured by the Arnold Electric Company, and the Long horn, manufactured by the G. Piel Company, Long Island City, N. Y. With respect to the last named accessory, the company announces a retail price reduction on the J-S model to \$10.

**The Hartford Suspension Company,** Jersey City, N. J., has taken the new building at 425 North Capitol boulevard as a new location for its Indianapolis branch, the former quarters having been at 448-50 North Capitol boulevard. The new place was built especially for the Truffault-Hartford concern, whose Indianapolis interests are cared for by S. C. Bohannon.

**The Richmond Forgings Corporation,** Richmond, Va., has opened a permanent office in the Dime Bank building at Detroit, Mich., which will be in charge of the

sales manager, L. C. Wellford. This company has also arranged with A. O. Knudson, Boston, Mass., to look after its large New England trade.

**The Lee Tire and Rubber Company,** Conshohocken, Penn., reports that the sale of its tires has quadrupled during the last nine months and an increase in the other departments of the business of more than 50 per cent. A new 600 horsepower addition to the boiler house is to be completed and a new calender and several 60-inch mills are on the ground ready for erection. Three new tire making machines and several hundred cores and side rings for the manufacture of pneumatic automobile tires are in transit. The total new equipment involves an expenditure of between \$50,000 and \$75,000.

**The Goodyear Tire and Rubber Company of Canada, Ltd.,** Bowmansville, Ont., has just announced several important changes in the personnel of the sales department. P. D. Saylor, vice president and sales manager of the Canada company, has been made president and managing director of the Goodyear Tire and Rubber Company of Great Britain, Ltd. R. P. D. Graham, secretary and manager of the tire department, has been promoted to the position of sales director, succeeding Mr. Saylor.

**The Factory Sales Company,** 716 Williamson building, Cleveland, O., is placing on the market a new keyless lock which operates like that of the combination safe, to prevent the theft of automobiles.

**The Republic Rubber Company's** clubhouse for employees at Youngstown, O., was formally opened Jan. 15. It is located on the east side of Albert street, directly opposite the general offices, and is 60 by 130 feet, three stories high. The first floor contains bowling alleys, pool tables, reading and lounging rooms and shower baths; the second provides a large dining room to accommodate



Clubhouse Recently Opened for Employees of Republic Rubber Company, Youngstown, O.

1200 persons, and a hall for lectures, dances, etc., and the third floor has a kitchen, a dining room for officers and office employees, living apartment for steward and rooms for the company's fire force.

**The F. S. Carr Company,** Boston, Mass., manufacturer of water proof automobile and carriage fabrics, has moved into the Francis building, 31 Beach street, where the general offices will be located.

**The S. & M. Tire Company,** Coshocton, O., expects to have its new plant in operation in a few weeks.

**The Lion Liner Company** of Appleton, Wis., has moved its factory and general office to Sheboygan, Wis.

**The Akron Tire Company,** Akron, O., has purchased land in Long Island City, N. Y., and will erect a branch factory there.

**The Nu Fen Manufacturing Company,** Indianapolis, Ind., has taken offices in the Hume-Mansur building. It is producing a new paint for automobile hoods, etc., which it is claimed will dry overnight.

**Dodge Bros.,** Detroit, has completed plans for a light four-cylinder machine. It will sell between \$690 and \$750 and production will begin next summer, after the Dodge plant concludes its existing contract with the Ford Motor Company for supplying gears and some detail parts for the Ford cars.

**The Swearington Tire Company,** Jacksonville, Fla., has taken over the good will and stock of R. W. Swearington and will manufacture tires, etc.

**The Cole Motor Car Company,** Indianapolis, Ind., has erected a large addition to its plant at a cost of \$200,000.



## RECENT PATENTS.

**Motor**, Harry W. Bolens, Port Washington, Wis.; No. 1,081,946. Filed May 26, 1911.

**Carbon Removing Process**, Harley M. Eller, Wollaston, Mass., assignor to Norfolk Manufacturing Company, Boston, Mass.; No. 1,081,950. Filed Jan. 27, 1913.

**Means for Reversing Motor**, Alan Ernest Leofric Chorlton, Manchester, England; No. 1,082,068. Filed March 18, 1913.

**Lamp Bracket**, Henry Alexander Goff, Englefield, England, assignor to John Drake, Egham, England; No. 1,082,079. Filed Jan. 23, 1912.

**Resilient Tread**, Philip W. Pratt, Boston, Mass.; No. 1,082,096. Filed March 23, 1912.

**Motor**, Malcolm W. Quiggle, Brooklyn, N. Y.; No. 1,082,138. Filed Feb. 17, 1912.

**Device for Preventing Excessive Pressure in Pneumatic Tires**, Walter H. Van Winkle, Newark, N. J.; No. 1,082,182. Filed July 15, 1911.

**Spring**, Adolphe Vermersch, Lille, France; No. 1,082,217. Filed Sept. 16, 1912.

**Stretcher or Bed for Automobiles**, Ralph Leonard Bradley, Stellacoom, Wash.; No. 1,082,223. Filed May 9, 1913.

**Cooling Apparatus**, Edgar de Normanville, Bayswater, England; No. 1,082,233. Filed April 28, 1913.

**Motor**, Enoch Prouty, Chicago, Ill.; No. 1,082,237. Filed Jan. 9, 1908.

**Demountable Rim**, Robert W. Ashley and Frank Oberkirch, New York City; No. 1,082,299. Filed Feb. 19, 1912.

**Enclosure for Motor Car Body**, August and Conrad Geissel, Philadelphia, Penn.; No. 1,082,316. Filed April 5, 1913.

**Spring Wheel**, Edmond R. White, Plattsburg, N. Y.; No. 1,082,380. Filed March 26, 1913.

**Two-Cycle Motor**, James Leonard Campbell, Barryton, Mich.; No. 1,082,402. Filed July 10, 1912.

**Lifting Jack**, Samuel Craig, Decatur, Ill.; No. 1,082,412. Filed Nov. 19, 1912.

**Fender**, Julius Didschuneit, Camden, S. C., assignor of one-fourth to Leguel A. Wittkowsky, same city; No. 1,082,415. Filed Sept. 10, 1913.

**Motor Ploov**, Orville E. Pattison, Winamac, Ind.; No. 1,082,440. Filed July 6, 1910.

**Automobile Skid**, Forrest G. Smith, Fitchburg, Mass.; No. 1,082,449. Filed Nov. 30, 1912.

**Resilient Tire**, Charles F. Strohn, Carthage, Mo.; No. 1,082,453. Filed Oct. 21, 1911.

**Folding Top**, Arthur Nolan Chenoweth, Waterbury, Conn., assignor of one-half to W. Richard Upson, same city; No. 1,083,273. Filed Aug. 27, 1912.

**Windshield**, Frank J. Falter, Norwalk, O.; No. 1,083,276. Filed Dec. 7, 1911.

**Auto Sled**, Michael Weldner, Lake Henry, Minn.; No. 1,083,312. Filed Oct. 2, 1912.

**Spring Wheel**, Lawrence W. Brown, Clinton, Mo.; No. 1,083,316. Filed May 11, 1912.

**Detachable Rim**, Arthur Frederick Gunstone, Bath, England, assignor to Captain Motor Wheel Company, Ltd., Bristol, England; No. 1,083,321. Filed April 14, 1910.

**Lubrication Mechanism for Combustion Engines**, Vincenzo Lancia, Turin, Italy; No. 1,083,329. Filed March 23, 1911.

**Lubricating System**, Harvey F. Maranville, Akron, O., assignor to Perfection Spring Company, Cleveland, O.; No. 1,083,332. Filed June 29, 1910.

**Detachable Wheel**, Leon Montupet, Paris, France, assignor to La Societe Montupet & Cie., Nogent-les-Vierges, Olse, France; No. 1,083,334. Filed Aug. 2, 1912.

**Resilient Wheel**, William A. Genringer, Allentown, Penn.; No. 1,083,396. Filed March 10, 1913.

**Steering Wheel Mechanism**, James E. Hanger, Jr., Atlanta, Ga., assignor of one-half to James H. Fenner, Jamestown, N. Y.; No. 1,083,399. Filed Dec. 4, 1909.

**Gasoline Tank**, William H. Smith, St. Paul, Minn.; No. 1,083,413. Filed Aug. 5, 1912.

**Motor**, Mark B. Crist, Pittsburg, Penn., assignor, by mesne assignments, to Colonial Trust Company, trustee, same city; No. 1,083,433. Filed April 20, 1910.

**Tire Inflation Apparatus**, Otto Ebert, Ironton, O.; No. 1,083,440. Filed Sept. 23, 1912.

**Starting Device**, Charles L. Montroy, Coahoma, Miss.; No. 1,083,457. Filed Sept. 27, 1912.

**Wheel**, Charles F. Womeldorf, Washington, D. C., assignor of one-half to William H. Rickard, Harrisonburg, Va.; No. 1,083,513. Filed May 19, 1913.

**Speed Controlling Device**, Sanford Keith Evans, Elmsford, N. Y.; No. 1,083,525. Filed March 26, 1913.

**Electric Searchlight**, Jean Gallay, Geneva, Switzerland; No. 1,083,530. Filed Jan. 6, 1913.

**Air Tube for Pneumatic Tires**, William R. Blowers, Toronto, Ont.; No. 1,083,584. Filed July 5, 1913.

**Turntable**, Joseph J. Grammes, Lakewood, O.; No. 1,083,609. Filed Aug. 4, 1913.

**Tire**, Paul Richter, Berlin, Germany; No. 1,083,632. Filed Feb. 8, 1912.

**Non-Skidding Device**, William Wenom, Kirkwood, Mo.; No. 1,083,644. Filed April 30, 1913.

**Resilient Tire**, Darwin H. Donachy, Williamsport, Penn., assignor of forty-nine one-hundredths to D. Tuttle Mahaffey, same place; No. 1,083,670. Filed Dec. 14, 1912.

**Motor**, Russell Scott Ellis, Philadelphia, Penn.; No. 1,083,673. Filed March 12, 1913.

**Speed Controlling Device**, Willis J. Perkins, Grand Rapids, Mich.; No. 1,083,701. Filed July 12, 1911.

**Wheel**, Gerome F. Tadini, New York City; No. 1,083,709. Filed Jan. 20, 1913.

**Control Lever Locking Device**, James W. Boulton, Spokane, Wash.; No. 1,083,793. Filed Aug. 8, 1912.

**Tire**, Carter J. Butts, Boston, Mass.; No. 1,083,798. Filed May 25, 1911.

## COMING EVENTS.

## January.

Jan. 24-31—Pleasure car show, Montreal, Que.

Jan. 24-31—Show, Rochester, N. Y.

Jan. 24-31—Pleasure car show, Coliseum, Chicago, Ill.

Jan. 26-31—Show, Scranton, Penn.

Jan. 31-Feb. 7—Show, Minneapolis, Minn.

## February.

Feb. 2-7—Show, Troy, N. Y.

Feb. 2-7—Pleasure car show, Buffalo, N. Y.

Feb. 3-7—Show, Kalamazoo, Mich.

Feb. 3-7—Commercial car show, Montreal, Que.

Feb. 4-7—Show, St. Joseph, Mo.

Feb. 7-12—Show, Seattle, Wash.

Feb. 7-14—Independent show, Cincinnati, O.

Feb. 9-14—Truck show, Buffalo, N. Y.

Feb. 9-14—Show, Grand Rapids, Mich.

Feb. 11-14—Show, Louisville, Ky.

Feb. 11-14—Show, Geneva, N. Y.

Feb. 14-21—Show, Pittsburg, Penn.

Feb. 16-21—Canadian national show, Toronto, Ont.

Feb. 16-21—Show, Kansas City, Mo.

Feb. 18-21—Show, Bloomington, Ill.

Feb. 21—Vanderbilt Cup race, Santa Monica, Cal.

Feb. 21-28—Show, Hartford, Conn.

Feb. 21-28—Show, First Regiment Armory, Newark, N. J.

Feb. 21-28—Pleasure car show, Cincinnati, O.

Feb. 21-28—Show, Elmira, N. Y.

Feb. 23-28—Show, Omaha, Neb.

Feb. 24-28—Show, Syracuse, N. Y.

Feb. 28—Grand Prize Race, Santa Monica, Cal.

## March.

March 2-4—Commercial car show, Cincinnati, O.

March 2-6—Show, Fort Dodge, Ia.

March 4-7—Show, Tiffin, O.

March 7-14—Pleasure car show, Mechanics' Building,

Boston, Mass.

March 9-14—Show, Des Moines, Ia.

March 17-21—Truck show, Mechanics' Building, Boston.

March 21-28—Show, St. John, N. B.

## April.

April 9-15—Show, Manchester, N. H.

## May.

May 24-25—Targa Florio race, Italy.

May 30—500-mile race, Indianapolis, Ind.

## June.

June 9-11—Isle of Man road race.

## July.

July 3-4—Road races, Tacoma, Wash.

July 4—Grand Prix, Lyons, France.

July 25-29—Grand Prix race, Belgium.

## August.

Aug. 28-29—Road races, Elgin, Ill.

## September.

Sept. 9—Road race, Corona, Cal.

Sept. 9—Grand Prix, Italy.



### PRIZE FOR NEW TIRE.

#### Austrian Ministry of War Offers \$10,000 for a Substitute for Rubber.

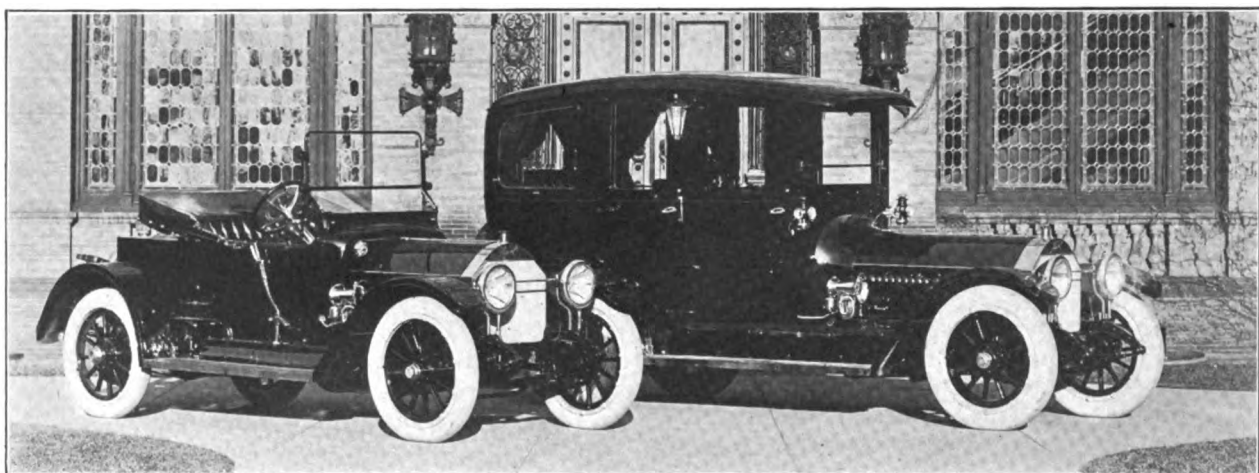
The ministry of war in Vienna, Austria, has offered a prize of \$10,000, to be awarded to the person who will, with adherence to certain prescribed conditions, construct an elastic tire of new material for motor freight wagons. Besides the specific attributes of pure rubber, such as elasticity and adhesiveness, the new material must possess essentially greater durability, or with equal durability, the attribute of essentially smaller cost of construction than the rubber tires, thereby reducing the expense of operating commercial vehicles. Its weight must not exceed that of pure rubber tires.

Competitors should hand in a model of the

Company, Springfield, Mass., and were built upon special order for Dr. Walter R. Weiser of that city. They consist of a special runabout, on the left, built with an extra wide seat to accommodate three people side by side, and a new type of berline limousine.

The runabout is to be utilized as a business vehicle, in that the doctor will use it in making professional calls about the city and vicinity. On the rear is fitted a trunk, affording sufficient space for storing a complete set of surgical instruments, uniforms, etc. The seating arrangement is with a view to carrying a nurse, in addition to the chauffeur, whenever this becomes necessary, or the doctor may drive himself and take a convalescent patient and nurse on an outing.

The limousine body is designed for extreme comfort. Extra wide doors permit free access



Two Handsome Body Designs Recently Produced for Springfield Man by Knox Automobile Company of That City.

fabric in natural or reduced size, together with drawings and description, at the latest by June 30, 1914, to the Automobil-Versuchsabteilung (Automobile Trial Division), VI, Gumpendorferstrasse 1, Vienna. Further details may be found in the Militarosche Rundschau, published at I Graben 23, Vienna, and to be had also on application in German of the K. K. Kriegsministerium, Vienna.

### TWO ATTRACTIVE BODIES.

#### Result of a Special Order Filled Recently by Knox Automobile Company.

The accompanying illustration presents two cars of somewhat unusual utility and beauty. These are the product of the Knox Automobile

Company, Springfield, Mass., and were built upon special order for Dr. Walter R. Weiser of that city. They consist of a special runabout, on the left, built with an extra wide seat to accommodate three people side by side, and a new type of berline limousine. The runabout is to be utilized as a business vehicle, in that the doctor will use it in making professional calls about the city and vicinity. On the rear is fitted a trunk, affording sufficient space for storing a complete set of surgical instruments, uniforms, etc. The seating arrangement is with a view to carrying a nurse, in addition to the chauffeur, whenever this becomes necessary, or the doctor may drive himself and take a convalescent patient and nurse on an outing. The limousine body is designed for extreme comfort. Extra wide doors permit free access

to either the front or rear compartment, and more than the ordinary space is provided for the driver. When the windows in the forward compartment are dropped, the car has all the appearance of an open front limousine. Great care in the arrangement and selection of the lighting has been taken in order that it should harmonize well with the general design, and the windows are of such size as to afford very free vision from any seat in the car. Because of greatly increased business during the past three months, the Pyrene Manufacturing Company, New York City, maker of Pyrene fire extinguishers, has increased its quarterly dividend, which was one per cent., Nov. 1, to 1.5 per cent. This will be paid Feb. 1, to stockholders of record Jan. 30.



## PHILADELPHIA'S AUTOMOBILE CLUBS.

**T**HE importance of Philadelphia as a motoring centre is evidenced by the number of motoring organizations in that city. Some of these have national prominence, and have had almost since the inception of the industry in America, at least on a commercial basis. Others may not be so well known, but they have numbered within their membership men who have had large influence in the industry. In one particular, at least, Philadelphia is somewhat distinctive in possessing two strong motoring organizations, the membership in which is limited to women. Brief mention of the various clubs and their activities is presented below:

### **Automobile Club of Philadelphia.**

The largest motoring organization in the state is the Automobile Club of Philadelphia, which compares very favorably in its importance and the scope of its work with the Automobile Club of America in New York City. It was organized in 1900 and headquarters were established at Broad and Locust streets, where the club remained until the completion of its handsome new building at 23rd street, south of Market, about a year ago. This building is patterned largely after the clubhouse of the Automobile Club of America, and provides practically the same facilities for its members. It provides storage space for 300 cars and it is proposed to add other floors to be available for automobile show purposes.

From the very first this organization has taken an active interest in everything that would add to the enjoyment of motoring. It claims to be the first club in the country to establish a touring information bureau, and it spent large sums in securing data, erecting road signs, etc., before other similar bodies took up this work.

The officers of the Automobile Club of Philadelphia are: President, Stedman Bent; vice president, Howard Longstreth; secretary-treasurer, S. Boyer Davis; directors, Powell Evans, S. Boyer Davis, Henry P. Bally, Jacob J. Seeds, Stedman Bent, Winfred J. Foss, Howard Longstreth, Robert P. Hooper, W. O. Griffith, Henry Souther, W. W. Atterbury, Charles Pickering.

### **Quaker City Motor Club.**

The Quaker City Motor Club is quite as well known as the older organization, through its interest in contest work. It was organized Feb. 21, 1907, and held its first successful race meet that fall and its first endurance run to Harrisburg on the following New Year's Day. Foremost among its achievements was the series of Fairmount Park races. The proceeds from its vari-

ous undertakings have been devoted to charity.

The clubrooms are in the Hotel Walton, and the officers are: President, Paul B. Huyette; first vice president, G. Douglass Bartlett; second vice president, B. H. Kirkbride; treasurer, Ralph L. Murray; secretary, A. E. Adams; board of governors, L. D. Berger, P. D. Powell, F. C. Dunlap, Ralph D. Earle, I. T. Shoemaker, Dr. S. Leon Gans, G. Hilton Gantert, George M. Graham and George E. Potts.

### **Automobile Club of Germantown.**

The Automobile Club of Germantown was chartered under the laws of Pennsylvania Jan. 28, 1904, with 23 members. It has worked in a quiet way for the benefit of owners in Philadelphia and elsewhere throughout the state, and was one of the three clubs which formed the Pennsylvania Motor Federation, the others being the Automobile Club of Philadelphia and the Automobile Club of Pittsburg. It owns its own home, valued at \$40,000, at Emlen and Carpenter streets.

The officers are: President, William H. Kingsley; vice president, William R. Harper; secretary, William T. Betts; treasurer, E. J. Hasse; board of governors, the officers and William D. Edson, William P. M. Braun, George H. Evans, Jonathan Jenks, B. F. Betts, Edward S. Jackson and William H. Lincoln.

### **Physicians' Motor Club.**

In some respects the Physicians' Motor Club of Philadelphia is entirely distinctive. As its name implies, none but physicians are eligible for membership. The club was organized in 1909 with 15 members, and the total is now about 450. The organization has no clubrooms, and its objects are not so much to encourage the use of automobiles for social enjoyment, as to co-operate with the police in a proper enforcement of the traffic regulations and motoring laws of the state and city.

The officers are: President, Dr. S. Leon Gans; first vice president, Dr. John J. Robrecht; second vice president, Dr. Charles A. E. Codman; third vice president, Dr. Landreth W. Thompson; secretary, Dr. Howard Sutton; treasurer, Dr. Louis H. Adler; directors, Drs. T. J. Ellinger, E. S. Saylor, Charles R. Haig, Elwood R. Kirby, Sylvester J. Deelan, H. Augustus Wilson, Ernest W. Kelsey and Francis J. Kelly.

### **Lu Lu Temple Auto Club.**

Organized June 14, 1911, the Lu Lu Temple Automobile Club is the youngest of the Philadelphia motoring organizations. It is composed



entirely of members of the Masonic fraternity, and was formed by the Shriners. So popular was the innovation that it has been necessary to raise the membership limitation twice, and the list now numbers some 350.

The objects are to assist the Potentate of the Mystic Shrine in entertaining visiting delegations of Masons, to aid charity and to hold social events in which members and their families may meet for general enjoyment. The rooms are at the Lu Lu Temple, and the officers are: Honorary president, Potentate W. Freeland Kendrick; president, Joseph Way; vice president, Charles L. Martin; treasurer, William G. Burk; secretary, Fred L. Bingham; board of governors, the officers and William Holt, George F. Pawling, Thomas R. Roberts, A. T. James, Walter Scholes, Max Laupheimer and John Fits.

#### **Quaker City Ladies' Motor Club.**

Philadelphia claims the distinction of having the first exclusive woman's motoring organization in the country, in the Quaker City Ladies' Motor Club, which was organized in 1907. It began with 13 members and now has 108. Its activities are largely in interesting women in motoring and driving their own cars, and assisting in securing better roads and more equitable motoring laws.

The clubrooms are at the St. James, and the officers are: President, Mrs. Richard Y. Filbert; first vice president, Mrs. Otto W. Schaum; second vice president, Mrs. Frank B. Stockley; secretary-treasurer, Mrs. Edward Beecher Finck; board of directors, Mrs. J. J. Martin, Sr., Mrs. George C. J. Finck, Mrs. Charles D. Pretzman, Mrs. Guy Gundaker, Mrs. Sarah Babcock, Mrs. W. Lewis Cave, Mrs. J. Willard Reading, Mrs. John H. Coates, Mrs. Thomas F. Durham and Mrs. Harry Douglas Stewart.

#### **La Moviganta Klubo.**

The second woman's automobile club is La Moviganta Klubo. While this is essentially a motor club, its membership includes practically every woman of social distinction in Philadelphia, and its real mission is social, rather than promotive of motoring activities. It is affiliated with the Royal Automobile Club of Great Britain.

The club was organized in 1907, and owns its own clubhouse and grounds at Mt. Pleasant, otherwise known by Philadelphians as the Benedict Arnold mansion, situated on the east side of the Schuylkill river, not far north of the Girard avenue bridge. The officers are: President, Miss Margaret L. Corlies; vice president, Miss Frances C. Griscom; treasurer, Mrs. John P.

Hollingsworth; secretary, Mrs. William J. Clothier; directors, Mrs. John Barnes Townsend, Miss Margaret C. Houston and Mrs. J. Kearsley Mitchell.

#### **WINTER MOTORING POPULAR.**

##### **Goodrich Company Finds Owners Are No Longer Storing Their Cars.**

That motorists are fast breaking away from the former custom of storing their cars during the winter months is the opinion of E. C. Tibbitts of the B. F. Goodrich Company, Akron, O., maker of Goodrich tires. This opinion is, of course, based upon the increase in the sale of tires during this period. Concerning the matter Mr. Tibbitts says:

This year will mark a tremendous increase in the number who will keep their cars in continuous service the entire year. This demonstrates that automobilists are educating themselves to a realization of the fact that motor cars are not alone a fair weather enjoyment and convenience, but a decided asset under severest conditions as well.

One of the chief objections, hitherto, to winter motoring has been the dangerous conditions of travel occasioned by bad roads, necessitating the use of chains, which often have a costly effect on tire maintenance. But with the safety tread tires now sold at prices less than previously asked for smooth treads, motorists are enabled to equip their cars with tires that are not only economical in first cost and in mileage rendered, but which assure the cars a safe foothold on the road bed, no matter how slippery, slushy or icy.

The "Safety First" movement, which we have fathered in its application to all-season motoring, has encouraged motorists to take no chances, yet has afforded them the opportunity to do so at low expense. His four wheels shod with safety tread tires, the motorist is ready for safe travel over any road, and the extra tread thickness means increased mileage and greater wearing strength, which more than compensate for the slight additional charge over the cost of smooth treads.

Robert J. Collier, the well known editor, has purchased a Sloane hydroaeroplane, made by the Sloane Aeroplane Company, New York City. The machine was designed by John E. Sloane, with the assistance of Frank Coffyn, and seats six persons. It is propelled by a 20-cylinder air-cooled motor, driving a 12-foot diameter propeller.

Judge Hand of the United States district court, in the southern district of New York, has handed down a decision in favor of the plaintiff in the action of the Allen Auto Specialty Company of that city, against the Niagara Auto Cover Company, alleging infringement of patents covering the Allen tire covers.

C. H. Dunlap, export manager of the Hupp Motor Car Company, Detroit, sailed Jan. 24 for South Africa.



**"THE TUGBOAT OF LAND COMMERCE"**

SOLVES THE  
HEAVY TRUCKING  
PROBLEM



**Knox**

MARTIN  
TRACTOR

SEND FOR CATALOGUE

**KNOX AUTO CO.,** SPRINGFIELD MASS.

Six Cylinder  
65 H. P.  
Equipped  
with Vulcan  
Electric Gear  
Shift

**HAYNES**

Four Cylinder  
40 H. P.  
Equipped  
with Vulcan  
Electric Gear  
Shift

America's First Car

Our advertising campaign will send a buyer into your showroom more than half convinced that he should own a Haynes; the sale, however, results only from a successful demonstration; it is our firm belief that, as a Haynes dealer, you possess more than a sufficient number of convincing arguments to make every demonstration result in a quick and profitable sale.

May we tell you why we believe this?

**THE HAYNES AUTOMOBILE COMPANY**  
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**"THE CAR  
AHEAD"**

### THREE GREAT MODELS

Pilot 50--4 cylinder, 4 1-2x6--59 H. P., 120 inch wheel base, roadster and touring car--\$2250. Pilot 50--Roadster--4, 6 and 7 passenger bodies, 126 inch wheel base--\$2500. Pilot 60--6 cylinder, 4x6, brake test 67 H. P., 132 inch wheel base roadster--4, 6 and 7 passenger touring cars--\$2785.

**The Car Without a Mechanical Defect**  
Testor "T" head motors, full floating rear axles, Brown-Lipe differential, Warner transmission, Eisemann Magneto, Carter Carburetor, handsome jewel bodies with ventilating windshield. Completely equipped, with every convenience and comfort. Dynamo electric lighting and electric starter (Gray & Davis system), power tire pump. We have the greatest agency proposition in the United States. Write for our beautiful art book showing cars in detail.

**PILOT CAR SALES CO.,**

Richmond, Indiana

## NOTICE

### SALE INTER-STATE AUTOMOBILE COMPANY MUNCIE, INDIANA

On February 5th, 1914, at 10:00 A. M., at the Court House, City of Muncie, Indiana, will be sold the assets of the Inter-State Automobile Co. in bulk and for cash. The assets of the Inter-State Automobile Co., Bankrupt, consist of Real Estate and Buildings, Machinery, Automobiles finished and in course of construction, Parts, Accessories and Office Furniture, etc. Bids will be received up until 9:00 A. M., February 5th, 1914, by

**EUGENE VATET, TRUSTEE**  
Suite 205, Vatet Building, Muncie, Ind.

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LUBRICANTS

**HARRIS**

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We have some interesting facts in connection with increasing your car sales and profits.

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### ALDING PORCELAIN PLUGS



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# The "Black Eagle" Spark Plug

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## 50 Cents Is Enough

The "Black Eagle" Spark Plug has made good because it was designed and manufactured with this result in view.

A person in close touch with the supply and manufacturing ends of the trade was a visitor at our factory recently, and was shown the details of construction, including the machinery, testing, and assembling of the "BLACK EAGLE" Spark Plug. What he said we believe will be of interest to you, as it indicates the effort on our part to supply a high grade plug at a reasonable price. We therefore quote below his impressions.

"I am simply amazed at the workmanship, material, and construction of the 'BLACK EAGLE' Spark Plug. When I saw this plug advertised at a price of 50c to the consumer, I naturally supposed it was a cheap, common, plug such as you occasionally find in jobbing houses on the bargain counter. I am convinced, after seeing these plugs tested, and examining minutely the machine parts which enter into their construction, that no better porcelain spark plug is offered by any one, regardless of the price they ask."

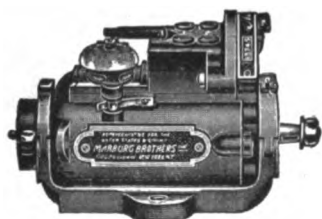


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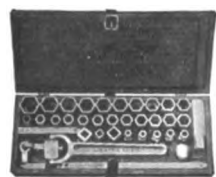
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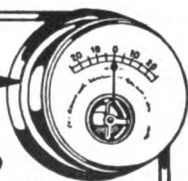
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**Motor Parts Co.**, 185-187 Columbus Ave., Boston; 818 No. Broad St., Philadelphia; Springfield, Mass.  
**Northwestern Chemical Co.**, Marietta, O.  
**Waite Auto Supply Co.**, 81 Exchange place, Providence.

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**Marburg Bros., Inc.**, 1790 Broadway, New York. (S. R. O.)  
**New Departure Mfg. Co.**, Bristol, Conn.  
**R. I. V. Co.**, 1771 Broadway, New York. (R. I. V.)

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**Geissler Bros. Storage Battery Co.**, 514 W. 57th St., New York.  
**Johns-Manville Co.**, H. W., Madison Ave. and 41st St., New York City. (J-M.)  
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Empire Automobile Co., Indianapolis, Ind. (Empire, Little Aristocrat.)

Haynes Automobile Co., 166 Main St., Kokomo, Ind. (Haynes.)

Henderson Motor Car Co., Indianapolis, Ind. (Henderson.)

Jackson Automobile Co., 1400 Main St., Jackson, Mich. (Jackson.)

Kissel Motor Car Co., 174 Kissel Ave., Hartford, Wis. (KisselKar.)

Knox Automobile Co., Springfield, Mass. (Knox.)

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Metz Company, Waltham, Mass. (Metz.)

Moline Automobile Co., E. Moline, Ill. (Moline.)

National Motor Vehicle Co., 1033 22nd St., Indianapolis. (National.)

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**Cartercar Co., Pontiac, Mich. (Cartercar.)**

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New York & New Jersey Lubricant Co., 165 Broadway, New York. (MoToRol, Non-Fluid, Kejex.)

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Standard Oil Co., New York. (Polarine.)

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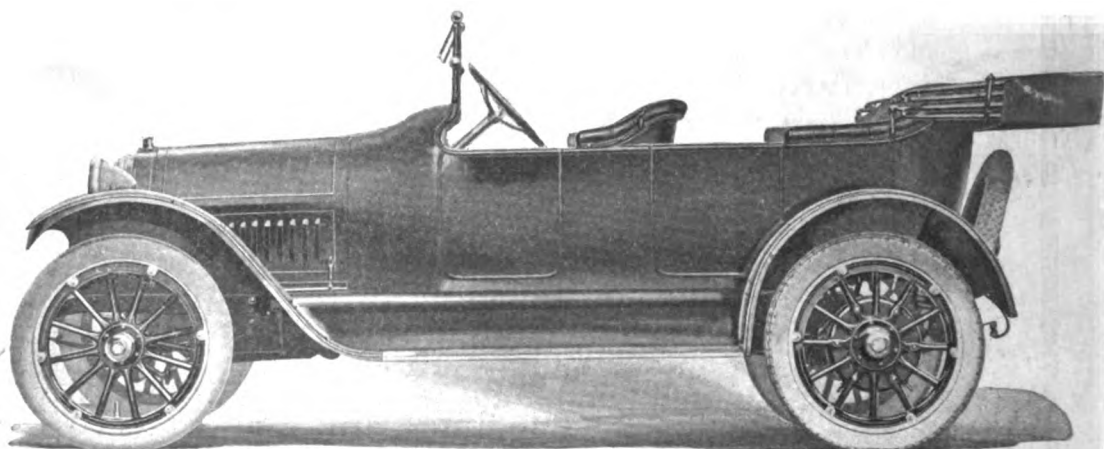
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